EVERSOURCE ENERGY

56 Prospect Street,
P.O. Box 270
Hartford, CT 06103

Kathleen M. Shanley
Manager – Transmission Siting
Tel: (860) 728-4527

October 15, 2020

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **Notice of Exempt Modification**
Eversource Site New London AWC
63 Myrock Avenue (AKA 61R Myrock Avenue), Waterford, CT 06385
Latitude: 41-20-9.80 N / Longitude: 72-6-56.40 W

Dear Ms. Bachman:

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") currently maintains multiple antennas at various mounting heights on an existing building located at 63 Myrock Avenue in Waterford, CT. See Attachment A, Parcel Map and Property Card. The building and property are owned by Eversource. Eversource plans to install one 18-foot 7-inch tall omni-directional antenna on the existing penthouse wall; the top of the antenna will extend to approximately 53-feet 8-inches above ground level ("AGL"). Two 7/8-inch diameter coaxial cables will be routed from the antenna into the existing building where it will terminate in an existing communications room. There will be no ground disturbance and no changes to the building or the existing antennas and equipment. The existing and proposed antennas on the building are depicted on Attachment B, Construction Drawings, dated September 15, 2020.

The proposed installation is part of Eversource's program to update the current obsolete analog voice radio communications system to a modern digital voice communications system. The new system will enable the highest level of voice communications under all operating conditions, including during critical emergency and storm restoration activities. The new radio system will also provide for remote control of distribution safety equipment.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies ("R.C.S.A.") §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this notice is being delivered to Rob Brule, First Selectman for the Town of Waterford and Abby Piersall, AICP, Planning Director for the Town of Waterford via private carrier. Proof of delivery is attached. See Attachment C, Proof of Delivery of Notice.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2):

1. There will be no change to the height of the existing building.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the new antenna will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard as shown in the attached Radio Frequency Emissions Report, dated September 22, 2020 (Attachment D – Power Density Report).
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure can support the proposed loading as shown in the attached Structural Analysis, performed May 12, 2020. (Attachment E – Structural Analysis).

For the foregoing reasons, Eversource respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Two copies of this notice and a check in the amount of $625 are enclosed.

Communications regarding this Notice of Exempt Modification should be directed to Kathleen Shanley at (860) 728-4527.

By: _____
Kathleen M. Shanley
Manager – Transmission Siting

cc: Honorable Rob Brule, First Selectman, Town of Waterford
Abby Piersall, AICP, Planning Director, Town of Waterford

Attachments

A. Parcel Map and Property Card
B. Construction Drawings
C. Proof of Delivery of Notice
D. Power Density Report
E. Structural Analysis

ATTACHMENT A – PARCEL MAP AND PROPERTY CARD


Legend
Approximate Antenna Location
MYROCK AVENUE
5002
20.64 AC
61
5000
0.46 AC
57
4999
0.24 AC
55
5001
0.45 AC
58
4.82 AC
80R
9192
27.7 AC
394
5005
9.93 AC
61A
5006
11.97 AC
61R
5003
21.63 AC
62
5007
2.73 AC
72R
4758
59 AC
48
lat:41.3339, long:-72.1177
40m
200ft
Tighe&Bond

61R MYROCK AVENUE

Location	61R MYROCK AVENUE	**Mblu**	140/ / 5006/ /
Acct#	00457700	**Owner**	CONNECTICUT LIGHT & POWER CO THE
Assessment	$3,887,590	**Appraisal**	$5,553,690
PID	5006	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$4,553,590	$1,000,100	$5,553,690

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$3,187,520	$700,070	$3,887,590

Parcel Addreses

Additional Addresses		
Address	**City, State Zip**	**Type**
61R MYROCK AVENUE		Primary

Owner of Record

Owner	CONNECTICUT LIGHT & POWER CO THE	**Sale Price**	$0
Co-Owner	OLD COLONY TRUST CO TR	**Certificate**	
		Book & Page	404/ 202
		Sale Date	06/01/1992
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
CONNECTICUT LIGHT & POWER CO THE	$0		404/ 202	00	06/01/1992

Building Information

Building 1 : Section 1

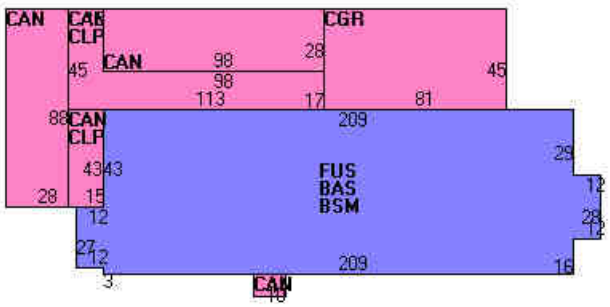
Year Built: 1900
Living Area: 31,834
Replacement Cost: $6,493,402
Building Percent Good: 65

Building Attributes	
Field	**Description**
STYLE	Proff Bldg
MODEL	Comm/Ind
Grade	Excellent
Stories:	2.00
Occupancy	1
Exterior Wall 1	Brick Veneer
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Forced Hot Air
% Central Air	100
Foundation	Poured Conc
Bldg Use	Commercial
Total Rooms	0
Total Bedrms	0
Total Fixtures	48
% Wet Sprinkler	100
% Dry Sprinkler	
1st Floor Use	
Heat/AC	HEAT/AC PKGS
Frame Type	MASONRY
Baths/Plumbing	ABOVE AVERAGE
% Finished	100
Class	C
Wall Height	12

Building Photo

(http://images.vgsi.com/photos/WaterfordCTPhotos//\00\01\12/29.JPG)

Building Layout



(http://images.vgsi.com/photos/WaterfordCTPhotos//Sketches/5006_5006.j

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	15,917	15,917
FUS	Finished Upper Story	15,917	15,917
BSM	Basement	15,917	0
CAN	Canopy	8,334	0
CGR	Comm Garage	3,645	0
CLP	Loading Platform	2,986	0
		62,716	31,834

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**

ELV1	ELEVATOR PASS	3 STOPS	$48,750	1
SPR2	WET/CONCEALED	35479 S.F.	$36,030	1

Land

Land Use

Use Code	201
Description	Commercial
Zone	R-20
Neighborhood	C2
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	11.97
Frontage	0
Depth	0
Assessed Value	$700,070
Appraised Value	$1,000,100

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving	AS	Asphalt	168400 S.F.	$210,500	1
LT1	Lights			19 UNITS	$7,600	1
LT2	W/DOUBLE LIGHT			6 UNITS	$4,800	1
FN3	FENCE-6' CHAIN			4200 L.F.	$25,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$4,553,590	$1,000,100	$5,553,690
2018	$4,553,590	$1,000,100	$5,553,690

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$3,187,520	$700,070	$3,887,590
2018	$3,187,520	$700,070	$3,887,590

ATTACHMENT B – CONSTRUCTION DRAWINGS

EVERSOURCE ENERGY

NEW LONDON AWC
63 MYROCK AVE
WATERFORD, CT 06385

PROJECT SUMMARY

THE GENERAL SCOPE OF WORK CONSISTS OF THE FOLLOWING:

1. INSTALL (1) NEW ANTENNA MAST PIPE ON EXISTING PENTHOUSE NORTH WALL
2. INSTALL (1) NEW OMNI/WHIP ANTENNA AT ELEVATION 53'–8 3/16"± AGL
3. INSTALL (1) NEW RACK WITH DMR EQUIPMENT IN EXISTING TELECOM ROOM

GOVERNING CODES

2018 CONNECTICUT STATE BUILDING CODE (2015 IBC BASIS)
2017 NATIONAL ELECTRIC CODE
TIA–222–H

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SITE INFORMATION

SITE NAME:	NEW LONDON AWC
SITE ID NUMBER:	#5006
SITE ADDRESS:	63 MYROCK AVE WATERFORD, CT 06385
MAP:	140
ZONE:	R–20
LATITUDE:	41° 20' 9.80" N
LONGITUDE:	72° 6' 56.40" W
ELEVATION:	44'± AMSL
FEMA/FIRM DESIGNATION:	X
ACREAGE:	11.97± AC (BOOK: 404, PAGE: 202)

CONTACT INFORMATION

APPLICANTS:
EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037

PROPERTY OWNER:
EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037

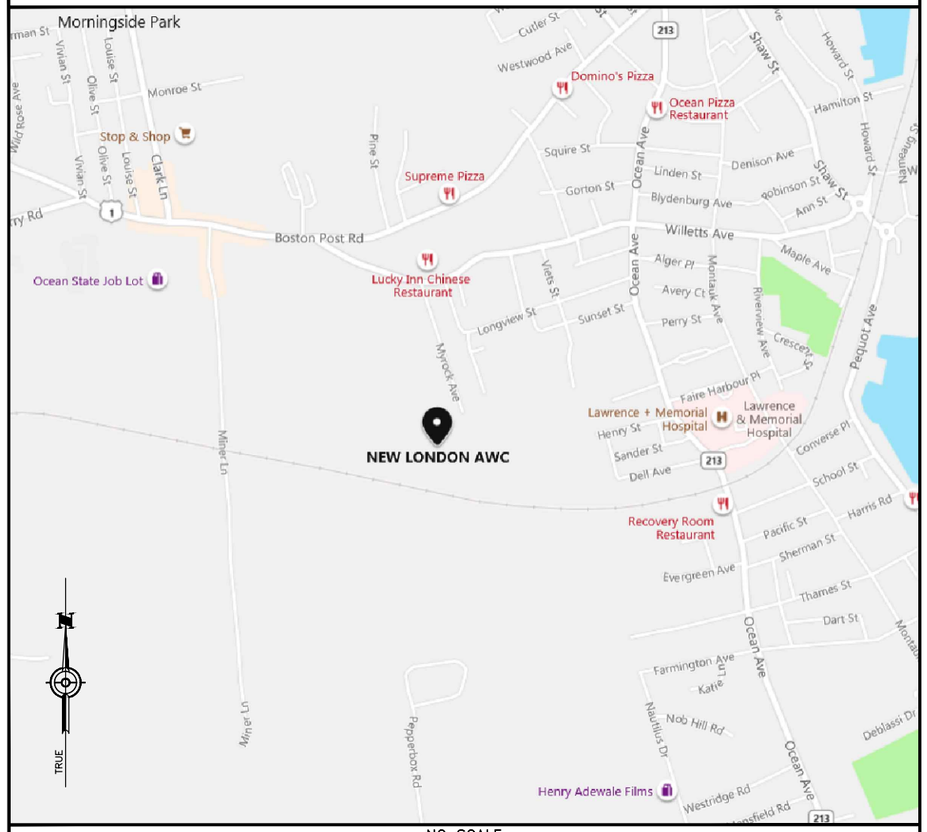
EVERSOURCE ENERGY
PROJECT MANAGER:
NIKOLL PRECI
(860) 655–3079

POWER PROVIDER:
EVERSOURCE ENERGY
(800) 286–2000

TELCO PROVIDER:
FRONTIER
(800) 921–8102

CALL BEFORE YOU DIG:
(800) 922–4455

LOCATION MAP



NO SCALE

DESIGN TYPE

SITE UPGRADE
ROOFTOP

DRAWING INDEX

SHEET NO:	SHEET TITLE
T–1	TITLE SHEET
C–1	ROOFTOP PLAN
C–2	BUILDING ELEVATION
S–1	STRUCTURAL DETAILS
S–2	STRUCTURAL DETAILS
S–3	STRUCTURAL DETAILS
G–1	GROUNDING DETAILS
G–2	GROUNDING DETAILS
G–3	GROUNDING DETAILS
N–1	NOTES & SPECIFICATIONS
N–2	NOTES & SPECIFICATIONS
N–3	NOTES & SPECIFICATIONS

DO NOT SCALE DRAWINGS

SUBCONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME

UNDERGROUND SERVICE ALERT
UTILITIES PROTECTION CENTER, INC.
811
48 HOURS BEFORE YOU DIG

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458–2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	TH

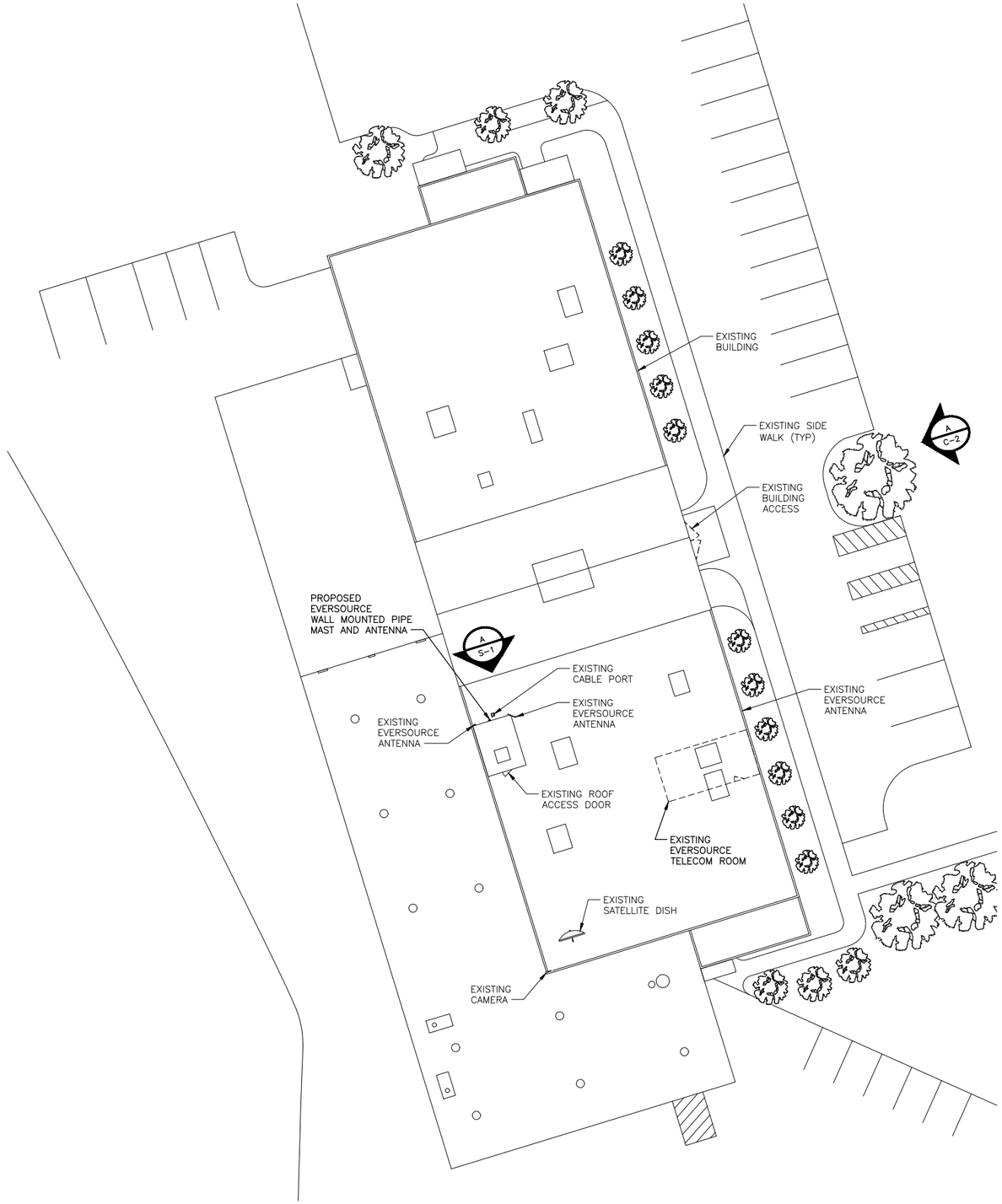
REV	DATE	DESCRIPTION
0	09/15/20	ISSUED FOR FILING

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED PROFESSIONAL ENGINEER
09/15/2020

NEW LONDON AWC
63 MYROCK AVE
WATERFORD, CT 06385

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



ROOFTOP PLAN
NO SCALE

EVERSOURCE ENERGY
107 SELDEN STREET
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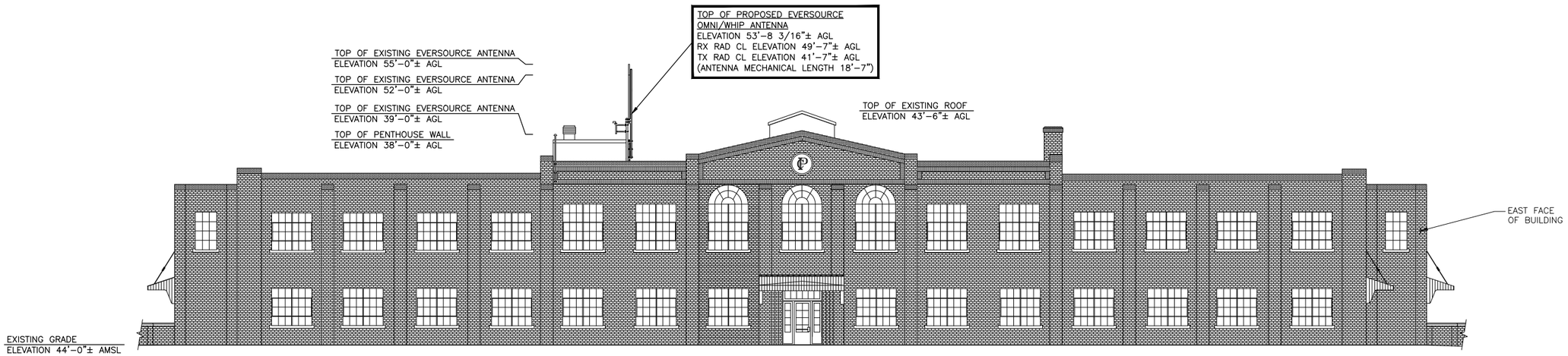
ROOFTOP PLAN

SHEET NUMBER
C-1



DETAIL A
BUILDING ELEVATION
NO SCALE

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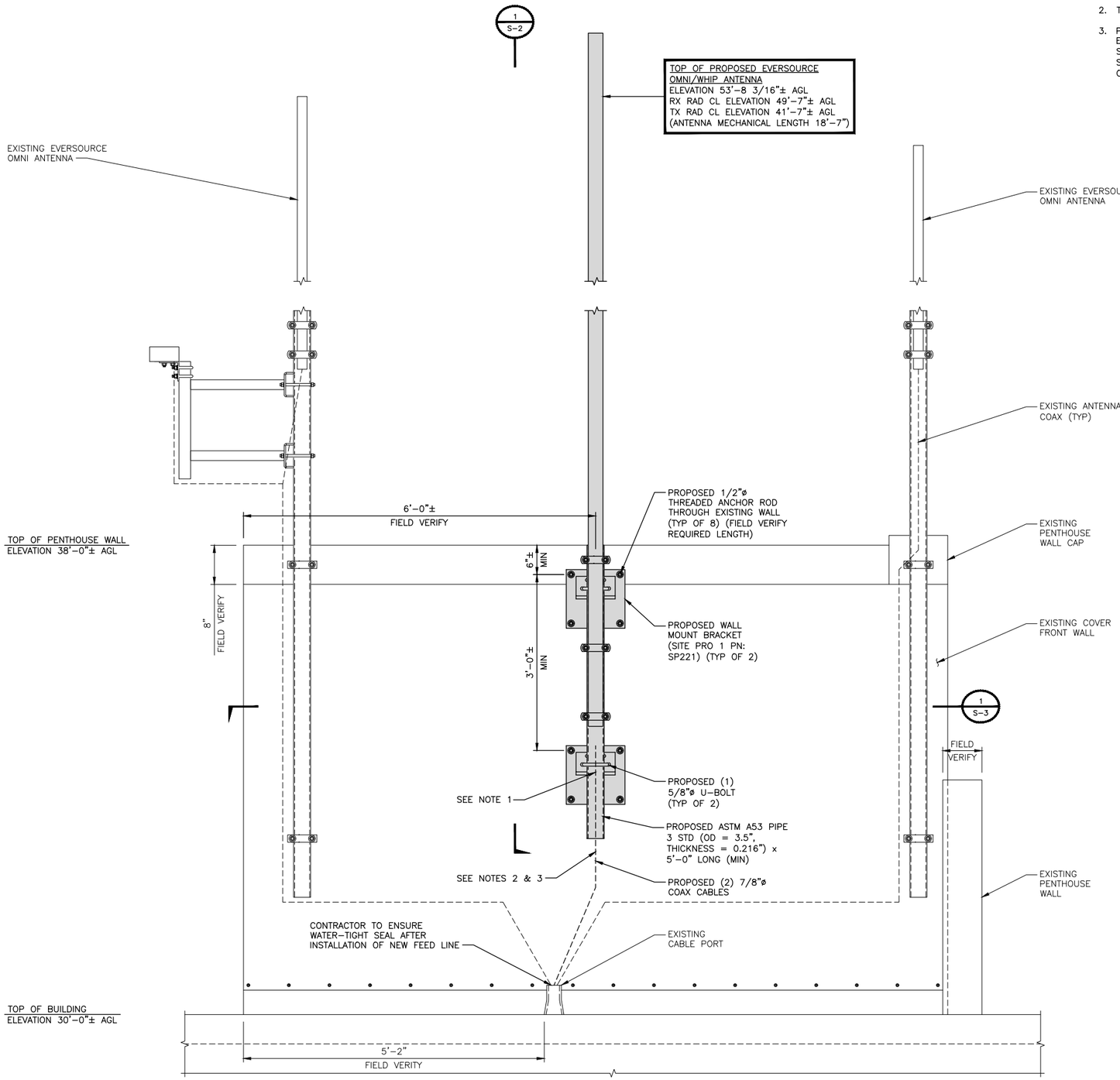
SHEET TITLE
BUILDING ELEVATION

SHEET NUMBER
C-2

NOTES

1. PROPOSED COAX CABLE TO BE BANDED TO THE PIPE MAST AT 4'–0" MAXIMUM VERTICAL SPACING.
2. THE PROPOSED COAX SHALL HAVE A DRIP LOOP BEFORE ENTERING THE BUILDING.
3. PROPOSED SITE PRO 1 P/N SP1586 WALL MOUNT BRACKET. INSTALL USING (2) 1/2"øx2" MINIMUM EMBEDMENT HILTI HAS–R304 THREADED ROD WITH HIT–HY70 EPOXY. MAINTAIN A MAXIMUM BRACKET SPACING OF 4'–0". INSTALL COAX RUNNING VERTICALLY ONTO PROPOSED WALL MOUNT BRACKET USING SITE PRO 1 P/N SIC2 SNAP–IN HANGERS KIT. FOLLOW MANUFACTURERS RECOMMENDATIONS (TYP TOTAL OF 1 KIT).



DETAIL A
NO SCALE

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107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

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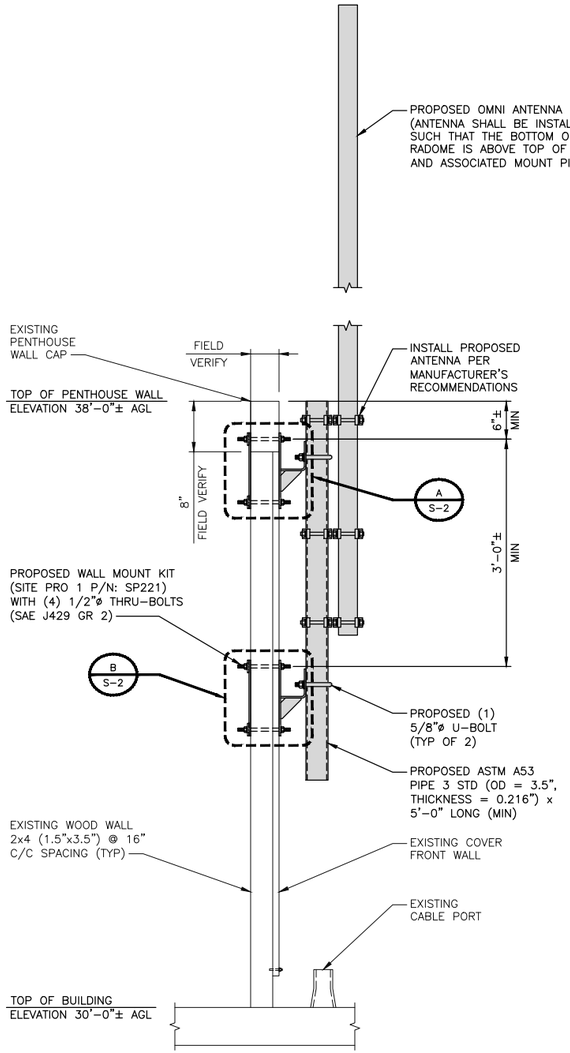
WATERFORD, CT 06385

SHEET TITLE
STRUCUTRAL DETAILS

SHEET NUMBER
S-1

NOTES

1. INSTALL COAX GROUND KITS AT BOTTOM OF ANTENNA AND BEFORE COAX ENTERS BUILDING. CONNECT #6 AWG. GROUND WIRE RUNNING FROM EGB TO ANTENNA MOUNT (SEE DETAILS SH G-3).
2. ALL THREADED RODS AND BOLTS SHALL HAVE ASSOCIATED WASHERS, LOCK WASHERS, AND NUTS INSTALLED PER SPECIFICATIONS.



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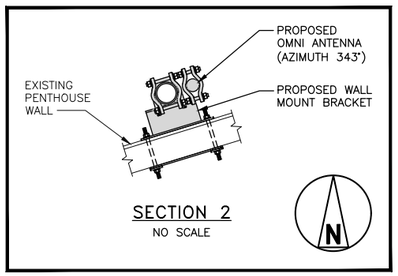

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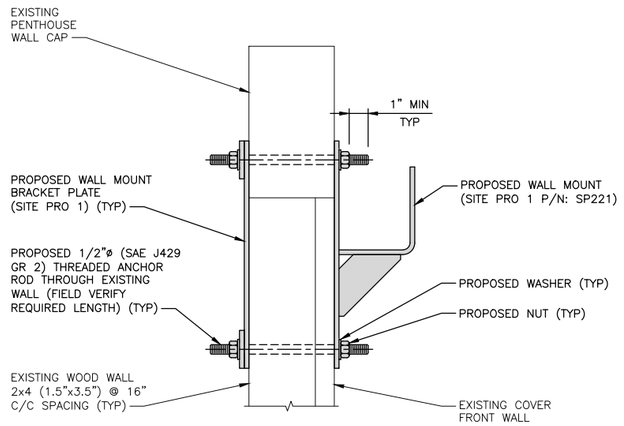
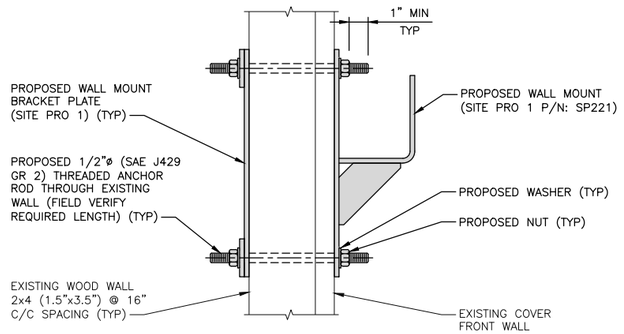


DETAIL A
NO SCALE



DETAIL B
NO SCALE

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
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BLACK & VEATCH
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09/15/2020

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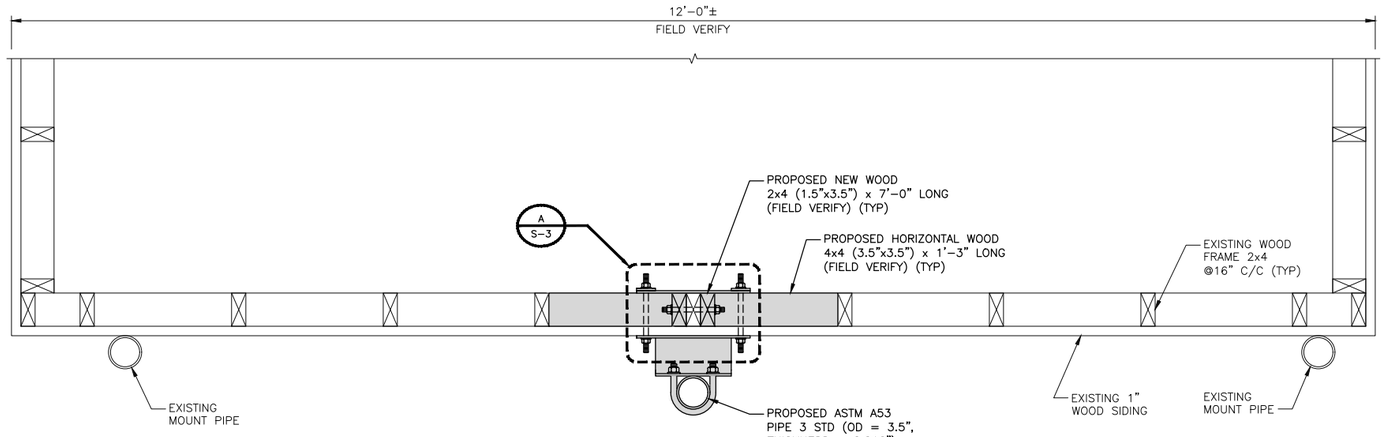
63 MYROCK AVE
WATERFORD, CT 06385

SHEET TITLE
STRUCUTRAL DETAILS

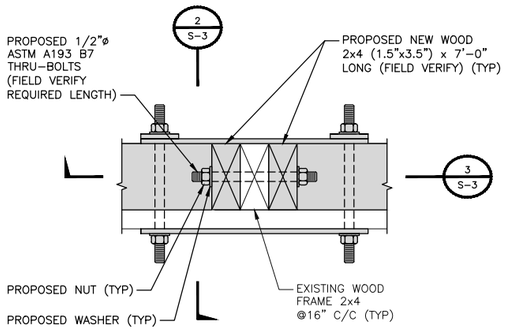
SHEET NUMBER
S-2

NOTES

1. CONTRACTOR SHALL NOTIFY EOR IMMEDIATELY IF EXISTING WALL DOES NOT MATCH THE DETAIL SHOWN HERE.
2. ALL THREADED RODS AND BOLTS SHALL HAVE ASSOCIATED WASHERS, LOCK WASHERS, AND NUTS INSTALLED PER SPECIFICATIONS.



SECTION 1
NO SCALE



DETAIL A
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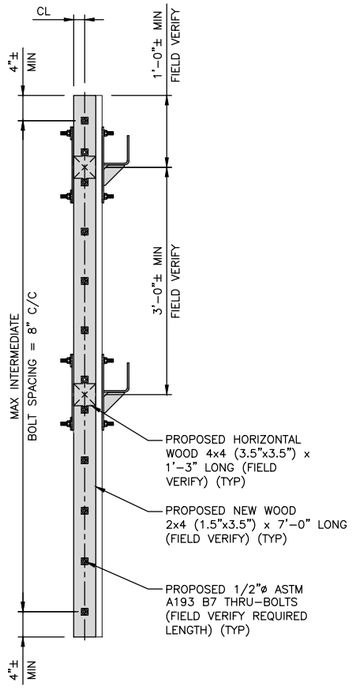

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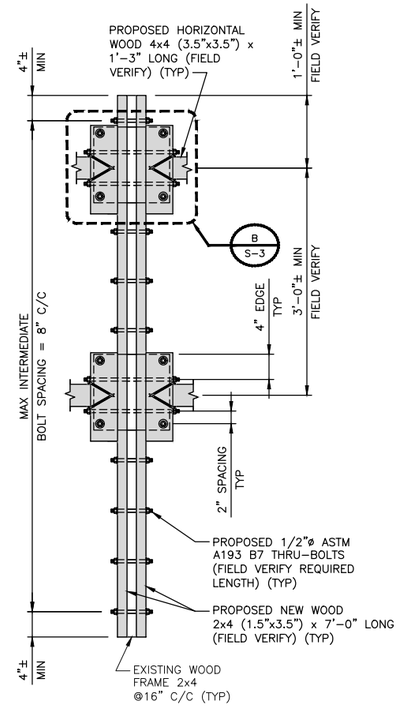

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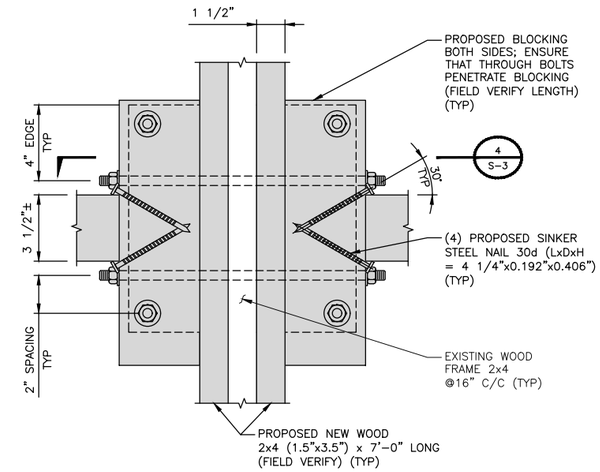

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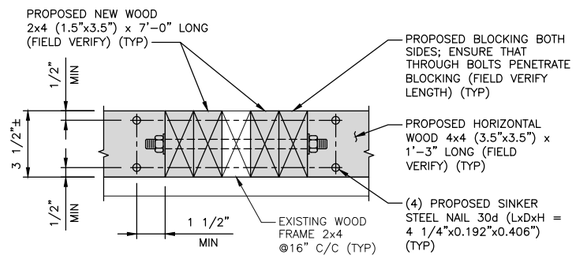

SECTION 4
NO SCALE

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107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH
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OVERLAND PARK, KS 66211
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SHEET TITLE
STRUCUTRAL DETAILS

SHEET NUMBER
S-3

LEGEND

- ● EXOTHERMIC (UNLESS NOTED OTHERWISE).
- ■ MECHANICAL CONNECTION.
- — — — GROUND WIRE.

KEY NOTES

(A) GROUND BAR: MOUNT GROUND BAR TO BUILDING.

(B) GROUNDING: EXOTHERMIC WELD NEW AWG #2 STD INSULATED GROUND CONNECTED TO BUILDING.

(C) GROUNDING TO EXISTING GROUND: CRIMP CONNECT NEW AWG #2 STD INSULATED GROUND TO EXISTING GROUND WIRE.

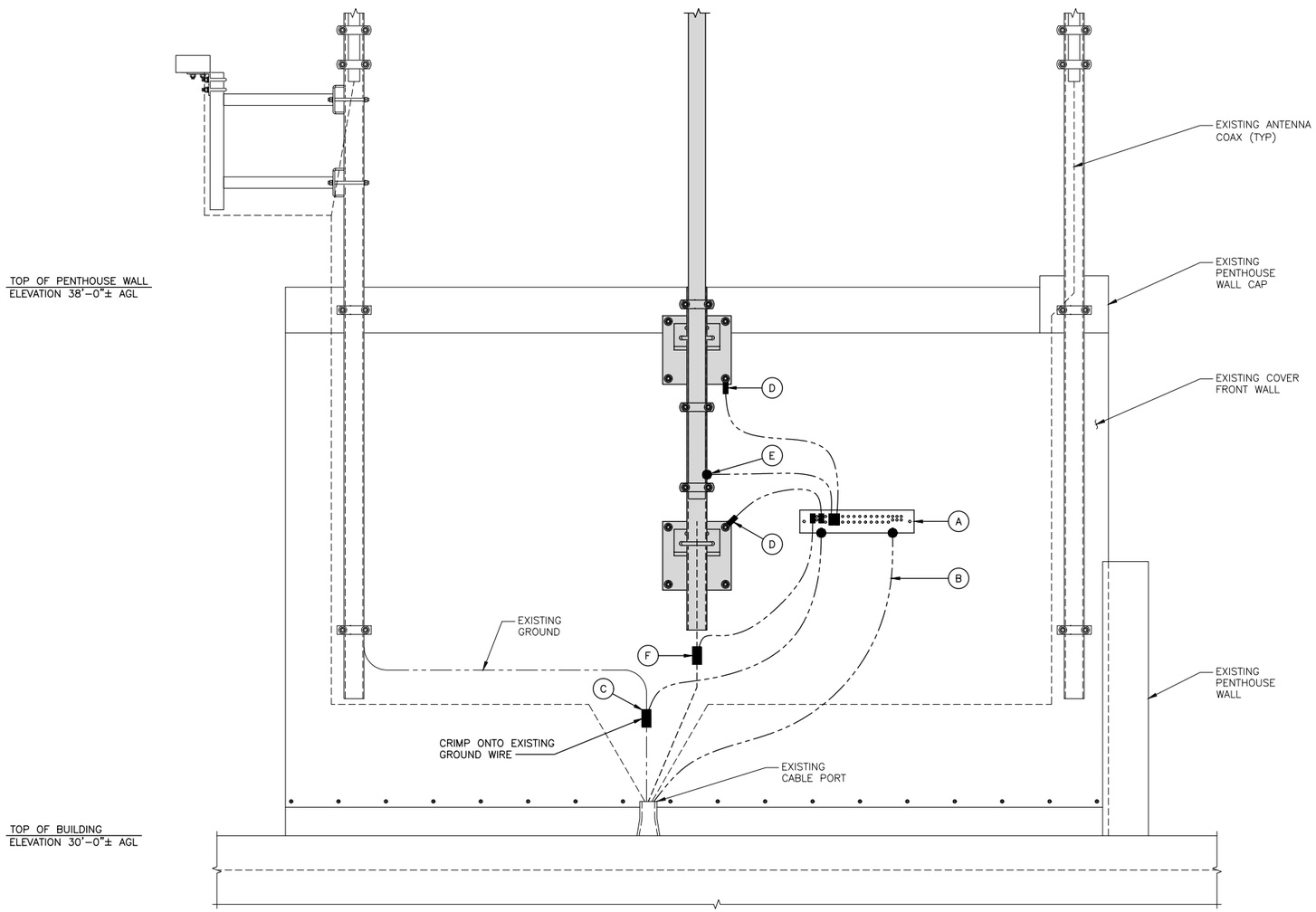
(D) MOUNT BRACKET GROUNDING: CONNECT #6 STD INSULATED GROUND WITH LUG TO MOUNT BRACKET.

(E) ANTENNA SUPPORT STRUCTURE GROUNDING: EXOTHERMIC WELD #6 STD INSULATED GROUND TO ANTENNA SUPPORT STRUCTURE.

(F) COAX GROUNDING: COAX GROUND TO GROUND BAR.

NOTE

1. INSTALL COAX GROUND KITS AT BOTTOM OF ANTENNA AND BEFORE COAX ENTERS BUILDING. CONNECT #6 AWG. GROUND WIRE RUNNING FROM EGB TO ANTENNA MOUNT.



GROUNDING DETAIL
NO SCALE

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STATE OF CONNECTICUT · MARK P. STILES · 24358 · LICENSED PROFESSIONAL ENGINEER
09/15/2020

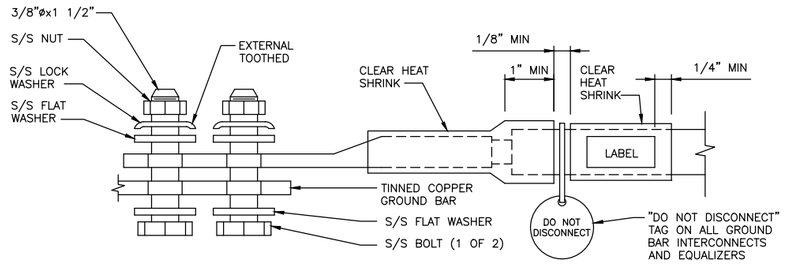
NEW LONDON AWC
63 MYROCK AVE
WATERFORD, CT 06385

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-1

NOTES

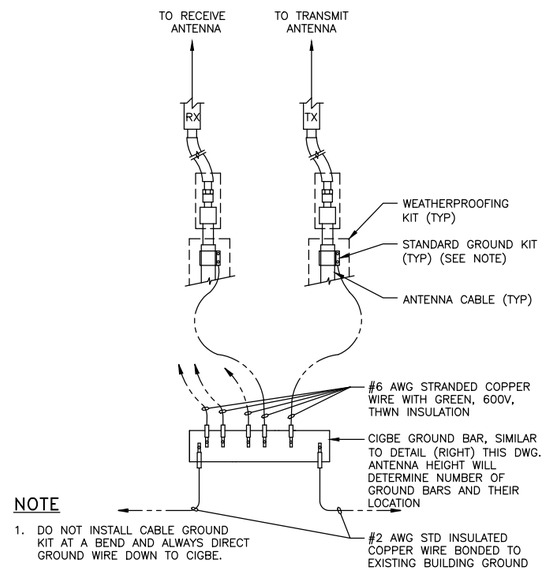
1. ALL LUGS SHALL BE 2–HOLE, LONG BARREL, TINNED SOLID COPPER UNLESS OTHERWISE SPECIFIED, USING THE PROPER U.L. TOOL AND CIRCUMFERENTIAL HEXAGON DIE. LUGS SHALL BE THOMAS AND BETTS SERIES 548##BE, BURNDY, ERICO OR EQUIVALENT. BOLT HOLE DIAMETER AND SPACING ON ALL GROUND LUGS SHALL MATCH HOLE DIAMETER AND SPACING OF THE GROUND BAR. ANGLE LUGS MAY BE USED IF CONSTRUCTION CONDITIONS DICTATE. REFER TO DETAIL "G".
2. AN ANTI–OXIDATION COMPOUND SHALL BE APPLIED BETWEEN THE LUG AND GROUND BAR ONLY. DO NOT COVER THE LUG. THE ANTI–OXIDATION COMPOUND SHALL BE THOMAS AND BETTS "KOPR–SHIELD" OR BURNDY PENETROX–E.
3. GROUND BARS SHALL BE ATTACHED TO THE ANTENNA SUPPORT STRUCTURES WITH U.L. APPROVED MOUNTING DEVICES. GROUND CLAMPS MAY BE USED TO MOUNT THE GROUND BAR TO AVAILABLE FLANGES, COAX PORT RIMS, ETC. STEEL STRAPS MAY BE USED TO ATTACH GROUND BAR TO A MONOPOLE IF NO CONVENIENT CLAMPING SURFACES ARE PRESENT. ALL CONNECTING SURFACES SHALL BE CLEAN AND FREE OF DIRT, OIL AND CORROSION. GALVANIZED SURFACES SHALL BE POLISHED WITH A STEEL BRUSH. DO NOT DRILL HOLES OR USE EXOTHERMIC WELDS TO CONNECT GROUND LEADS TO A STEEL TOWER EXCEPT ON STEEL TABS OR FLANGES SPECIFICALLY DESIGNED FOR THAT PURPOSE.



NOTES

1. ALL HARDWARE 18–8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI–OXIDANT COMPOUND BEFORE MATING.
2. ALL HARDWARE SHALL BE S/S 3/8 INCH DIAMETER OR LARGER.
3. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI–OXIDANT COMPOUND BEFORE MATING.

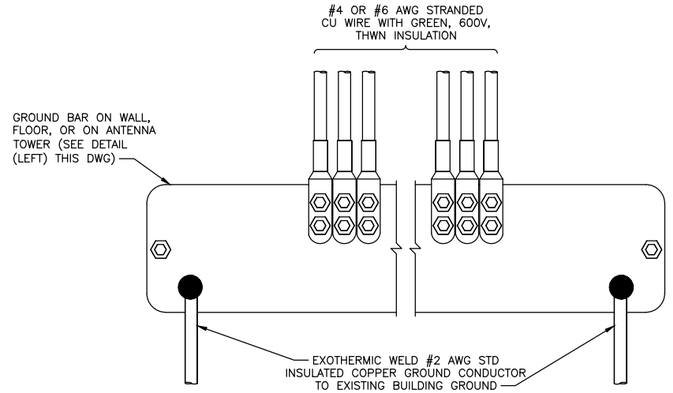
TWO HOLE LUG
NO SCALE



NOTE

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRE TO EXTERIOR GROUNDING BAR
NO SCALE



NOTE

1. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.

INSTALLATION OF GROUND WIRE TO EXTERIOR GROUNDING BAR
NO SCALE

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458–2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	TH

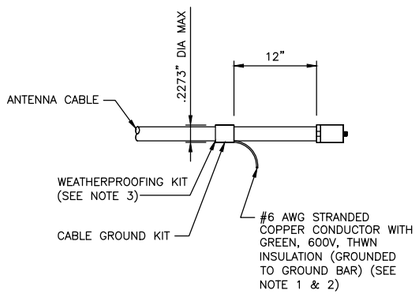
REV	DATE	DESCRIPTION
0	09/15/20	ISSUED FOR FILING

STATE OF CONNECTICUT · MARK P. STILES · 24358 · LICENSED PROFESSIONAL ENGINEER
09/15/2020

NEW LONDON AWC
63 MYROCK AVE
WATERFORD, CT 06385

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

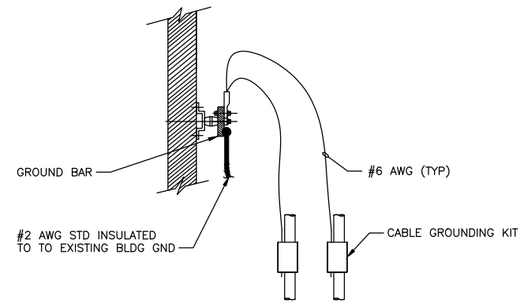


NOTES

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NO SCALE



CABLE INSTALLATION

NO SCALE

EVERSOURCE ENERGY
107 SELDEN STREET
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SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-3

DESIGN BASIS

1. GOVERNING CODE: 2018 CONNECTICUT STATE BUILDING CODE (2015 IBC BASIS).

GENERAL CONDITIONS

1. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL BUILDING CODES, PERMIT CONDITIONS AND SAFETY CODES DURING CONSTRUCTION.

2. THE ENGINEER IS NOT: A GUARANTOR OF THE INSTALLING CONTRACTOR'S WORK; RESPONSIBLE FOR SAFETY IN, ON OR ABOUT THE WORK SITE; IN CONTROL OF THE SAFETY OR ADEQUACY OF ANY BUILDING COMPONENT, SCAFFOLDING OR SUPERINTENDING THE WORK.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL PERMITS, INSPECTIONS, TESTING AND CERTIFICATES NEEDED FOR LEGAL OCCUPANCY OF THE FINISHED PROJECT.

4. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THIS COMPLETE PLAN SET AND VERIFY THE EXISTING CONDITIONS SHOWN IN THESE PLANS AS THEY RELATE TO THE WORK PRIOR TO SUBMITTING PRICE. SIGNIFICANT DEVIATIONS FROM WHAT IS SHOWN AFFECTING THE WORK SHALL BE REPORTED IMMEDIATELY TO THE CONSTRUCTION MANAGER.

5. DETAILS INCLUDED IN THIS PLAN SET ARE TYPICAL AND APPLY TO SIMILAR CONDITIONS.

6. EXISTING ELECTRICAL AND MECHANICAL FIXTURES, PIPING, WIRING, AND EQUIPMENT OBSTRUCTING THE WORK SHALL BE REMOVED AND/OR RELOCATED AS DIRECTED BY THE CONSTRUCTION MANAGER. TEMPORARY SERVICE INTERRUPTIONS MUST BE COORDINATED WITH OWNER.

7. THE CONTRACTOR SHALL DILIGENTLY PROTECT THE EXISTING BUILDING/SITE CONDITIONS AND THOSE OF ANY ADJOINING BUILDING/SITES AND RESTORE ANY DAMAGE CAUSED BY HIS ACTIVITIES TO THE PRE-CONSTRUCTION CONDITION.

8. THE CONTRACTOR SHALL SAFEGUARD AGAINST: CREATING A FIRE HAZARD, AFFECTING TENANT EGRESS OR COMPROMISING BUILDING SITE SECURITY MEASURES.

9. THE CONTRACTOR SHALL REMOVE ALL DEBRIS AND CONSTRUCTION WASTE FROM THE SITE EACH DAY. WORK AREAS SHALL BE SWEPT AND MADE CLEAN AT THE END OF EACH WORK DAY.

10. THE CONTRACTOR'S HOURS OF WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES AND BE APPROVED BY OWNER.

11. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER IF ASBESTOS IS ENCOUNTERED DURING THE EXECUTION OF HIS WORK. THE CONTRACTOR SHALL CEASE ALL ACTIVITIES WHERE THE ASBESTOS MATERIAL IS FOUND UNTIL NOTIFIED BY THE CONSTRUCTION MANAGER TO RESUME OPERATIONS.

THERMAL & MOISTURE PROTECTION

1. FIRE-STOP ALL PENETRATIONS FOR ELECTRICAL CONDUITS OR WAVEGUIDE CABLING THROUGH BUILDING WALLS, FLOORS, AND CEILINGS SHALL BE FIRESTOPPED WITH ACCEPTED MATERIALS TO MAINTAIN THE FIRE RATING OF THE EXISTING ASSEMBLY. ALL FILL MATERIAL SHALL BE SHAPED, FITTED, AND PERMANENTLY SECURED IN PLACE. FIRESTOPPING SHALL BE INSTALLED IN ACCORDANCE WITH ASTM E814.

2. HILTI CP620 FIRE FOAM OR 3M FIRE BARRIER FILL, VOID OR CAVITY MATERIAL OR ACCEPTED EQUAL SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ASSOCIATED UNDERWRITERS LABORATORIES (UL) SYSTEM NUMBER.

3. FIRESTOPPING SHALL BE APPLIED AS SOON AS PRACTICABLE AFTER PENETRATIONS ARE MADE AND EQUIPMENT INSTALLED.

4. FIRESTOPPED PENETRATIONS SHALL BE LEFT EXPOSED AND MADE AVAILABLE FOR INSPECTION BEFORE CONCEALING SUCH PENETRATIONS. FIRESTOPPING MATERIAL CERTIFICATES SHALL BE MADE AVAILABLE AT THE TIME OF INSPECTION.

5. ANY BUILDING ROOF PENETRATION AND/OR RESTORATION SHALL BE PERFORMED SO THAT THE ROOF WARRANTY IN PLACE IS NOT COMPROMISED. CONTRACTOR SHALL ARRANGE FOR OWNER'S ROOFING CONTRACTOR TO PERFORM ANY AND ALL ROOFING WORK IF SO REQUIRED BY EXISTING ROOF WARRANTY. OTHERWISE, ROOF SHALL BE MADE WATERTIGHT WITH LIKE CONSTRUCTION AS SOON AS PRACTICABLE AND AT COMPLETION OF CONSTRUCTION.

6. ALL PENETRATIONS INTO AND/OR THROUGH BUILDING EXTERIOR WALLS SHALL BE SEALED WITH SILICONE SEALER.

7. WHERE CONDUIT AND CABLES PENETRATES FIRE RATED WALLS AND FLOORS, FIRE GROUT ALL PENETRATIONS IN ORDER TO MAINTAIN THE FIRE RATING USING A LISTED FIRE SEALING DEVICE OR GROUT.

8. CONTRACTOR TO REMOVE AND RE-INSTALL ALL FIRE PROOFING AS REQUIRED DURING CONSTRUCTION.

SUBMITTALS

1. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO FABRICATION.

2. CONTRACTOR TO NOTIFY ENGINEER FOR INSPECTION PRIOR TO CLOSING PENETRATIONS.

3. CONTRACTORS SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. THE ENGINEER SHALL BE NOTIFIED OF ANY CONDITIONS WHICH PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

4. ALL STEEL MATERIAL EXPOSED TO WEATHER SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 " ZINC (HOT-DIPPED GALVANIZED) COATINGS" ON IRON AND STEEL PRODUCTS.

5. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS FOR REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

STEEL

1. MATERIAL:

WIDE FLANGE:	ASTM A572, GR 50
TUBING:	ASTM A500, GR C
PIPE:	ASTM A53, GR B
BOLTS:	ASTM A325
GRATING:	TYPE GW-2 (1"x3/16" BARS)
MISC. MATERIAL:	ASTM A36

ALL STEEL SHAPES SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 WITH A COATING WEIGHT OF 2 OZ/SF.

2. DAMAGED GALVANIZED SURFACES SHALL BE CLEANED WITH A WIRE BRUSH AND PAINTED WITH TWO COATS OF COLD ZINC, "GALVANOX", "DRY GALV", "ZINC IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES. TOUCH UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT IN SHOP OR FIELD.

3. DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC "MANUAL OF STEEL CONSTRUCTION" 13TH EDITION.

4. THE STEEL STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER COMPLETION. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION.

5. ALL STEEL ELEMENTS SHALL BE INSTALLED PLUMB AND LEVEL.

6. TOWER MANUFACTURER'S DESIGNS SHALL PREVAIL FOR TOWER.

CONNECTIONS

1. CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR AND CONSTRUCTED IN ACCORDANCE WITH THE AISC "MANUAL OF STEEL CONSTRUCTION" 13TH EDITION. CONNECTIONS SHALL BE PROVIDED TO CONFORM TO THE REQUIREMENTS OF TYPE 2 CONSTRUCTION UNLESS OTHERWISE DETAILED. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.

2. DESIGN CONNECTIONS AT BEAM ENDS FOR 10 KIPS (MIN).

3. ALL BUILDING CONNECTION POINTS ARE TO BE CENTERED OVER BEARING WALLS

4. CONNECTIONS SHALL BE MADE USING ASTM A325 BOLTS (SNUG TIGHT OR SLIP CRITICAL) OR WELDS. IF TENSION CONTROL BOLTS ARE USED, CONNECTIONS SHALL BE DESIGNED FOR SLIP CRITICAL BOLT ALLOWABLE LOAD VALUES.

5. NUT LOCKING DEVICES ARE REQUIRED FOR ALL BOLT ASSEMBLIES.

6. GRATING SHALL BE ATTACHED USING FOR GRATING CLAMPS OR 1/4 INCH FILLET WELDS. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY BE 5/8" DIAMETER GALVANIZED ASTM A307 BOLTS UNLESS OTHERWISE NOTED.

7. ALL BOLTS, ANCHORS, AND MISCELLANEOUS HARDWARE EXPOSED TO WEATHER SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE."

8. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". UPON COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED. SEE NOTE ABOVE.

9. USE THE LARGER OF 1/4 INCH FILLET WELDS OR MINIMUM SIZE PER AISC REQUIREMENTS WHERE NO WELD SIZE IS SHOWN ON THE DRAWINGS.

10. ALL ARC AND GAS WELDING SHALL BE DONE BY LICENSED AND CERTIFIED WELDER IN ACCORDANCE WITH AMERICAN WELDING SOCIETY.

11. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. UPON THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATINGS SHALL REPAIRED.

12. USE PRECAUTIONS AND PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED METALS.

ANCHORS

1. EXPANSION ANCHORS SHALL BE USED WHERE ATTACHING TO CONCRETE. MASONRY MOUNTS SHALL HAVE INJECTION ADHESIVE ANCHORING.

2. EXPANSION BOLTS SHALL BE HILTI KWIK BOLT 3 OR APPROVED EQUAL. MINIMUM EMBEDMENT SHALL BE 4 INCHES.

3. INJECTION ADHESIVE ANCHORING IN MASONRY WITH VOIDS SHALL BE HILTI HY-70 OR EQUAL WITH THREADED ROD AND SCREEN TUBES TO THE FOLLOWING BASE MATERIALS.

   BRICK WITH HOLES:
   SPACE ANCHORS 2 COMPLETE BRICKS APART MINIMUM.
   MAINTAIN 2 COMPLETE BRICKS OR 16 INCHES FROM FREE EDGES (WHICHEVER IS LESS).
   EMBEDMENT: 3 1/2 INCHES MINIMUM.

   HOLLOW CONCRETE BLOCK:
   USE 50% MORE ANCHORS THAN SHOWN IN DETAIL.
   SPACING: ONE ANCHOR MAXIMUM PER BLOCK CELL.
   MAINTAIN 12 INCH SPACING FROM FREE EDGES.
   EMBEDMENT: THROUGH FACE.

4. INJECTION ADHESIVE ANCHORING IN SOLID MASONRY AND GROUT FILLED BLOCK SHALL BE HILTI HIT HY-200 OR EQUAL WITH THREADED ROD. MAINTAIN 12 INCH SPACING BETWEEN ANCHORS AND ALL FREE EDGES. MINIMUM SPACING BETWEEN ANCHORS IS 8 INCHES.

5. ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT BE INSTALLED IN MORTAR JOINTS.

6. GRATING SHALL BE ATTACHED USING FOR GRATING CLAMPS OR 1/4 INCH FILLET WELDS. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY BE 5/8" DIAMETER GALVANIZED ASTM A307 BOLTS UNLESS OTHERWISE NOTED.

SITE GENERAL

1. CONTRACTOR SHALL FOLLOW CONDITIONS OF ALL APPLICABLE PERMITS AND WORK IN ACCORDANCE WITH OSHA REGULATIONS.

2. THESE PLANS DEPICT KNOWN UNDERGROUND STRUCTURES, CONDUITS, AND/OR PIPELINES. THE LOCATIONS FOR THESE ELEMENTS ARE BASED UPON THE VARIOUS RECORD DRAWINGS AVAILABLE. THE CONTRACTOR IS HEREBY ADVISED THAT THESE DRAWINGS MAY NOT ACCURATELY DEPICT AS-BUILT LOCATIONS AND OTHER UNKNOWN STRUCTURES. THE CONTRACTOR SHALL THEREFORE DETERMINE THE EXACT LOCATION OF EXISTING UNDERGROUND ELEMENTS AND EXCAVATE WITH CARE AFTER CALLING MARKOUT SERVICE AT 1-800-272-4480 48 HOURS BEFORE DIGGING, DRILLING OR BLASTING.

3. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, AND OTHER UTILITIES WHERE ENCOUNTERED, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION, SHALL BE RELOCATED AS DIRECTED BY ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL HAND DIG UTILITIES AS NEEDED. CONTRACTOR SHALL PROVIDE, BUT IS NOT LIMITED TO, APPROPRIATE A) FALL PROTECTION, B) CONFINED SPACE ENTRY, C) ELECTRICAL SAFETY, AND D) TRENCHING AND EXCAVATION.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, OR OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT THE POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF THE CONSTRUCTION MANAGER.

6. CONTRACTOR IS RESPONSIBLE FOR REPAIRING OR REPLACING STRUCTURES OR UTILITIES DAMAGED DURING CONSTRUCTION.

7. CONTRACTOR SHALL PROTECT EXISTING PAVED AND GRAVEL SURFACES, CURBS, LANDSCAPE AND STRUCTURES AND RESTORE SITE OR PRE-CONSTRUCTION CONDITION WITH AS GOOD, OR BETTER, MATERIALS. NEW MATERIALS SHALL MATCH EXISTING THICKNESS AND TYPE.

8. THE CONTRACTOR SHALL SHORE ALL TRENCH EXCAVATIONS GREATER THAN 5 FEET IN DEPTH OR LESS WHERE SOIL CONDITIONS ARE DEEMED UNSTABLE. ALL SHEETING AND/OR SHORING METHODS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.

9. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING GROUNDWATER LEVELS IN THE VICINITY OF EXCAVATIONS TO PROTECT ADJACENT PROPERTIES AND NEW WORK. GROUNDWATER SHALL BE DRAINED IN ACCORDANCE WITH LOCAL SEDIMENTATION AND EROSION CONTROL GUIDELINES.

EVERSOURCE ENERGY
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STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED PROFESSIONAL ENGINEER
09/15/2020

NEW LONDON AWC
63 MYROCK AVE
WATERFORD, CT 06385

SHEET TITLE
NOTES & SPECIFICATIONS

SHEET NUMBER
N-1

ELECTRICAL

1. CONTRACTOR SHALL VERIFY EXISTING ELECTRIC SERVICE TYPE AND CAPACITY AND ORDER NEW ELECTRIC SERVICE FROM LOCAL ELECTRIC UTILITY, WHERE APPLICABLE.
2. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES, AND SHALL BE ACCEPTABLE TO ALL AUTHORITIES HAVING JURISDICTION. WHERE A CONFLICT EXISTS BETWEEN CODES, PLAN AND SPECIFICATIONS, OR AUTHORITIES HAVING JURISDICTION, THE MORE STRINGENT AUTHORITIES SHALL APPLY.
3. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC, FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN AND/OR OTHERWISE REQUIRED.
4. ALL ELECTRICAL CONDUCTORS SHALL BE 100% COPPER AND SHALL HAVE TYPE THHN INSULATION UNLESS INDICATED OTHERWISE.
5. CONDUIT SHALL BE THREADED RIGID GALVANIZED STEEL OR EMT WITH ONLY COMPRESSION TYPE COUPLINGS AND CONNECTORS, ALL MADE UP WRENCH TIGHT.
6. ALL BURIED CONDUIT SHALL BE MINIMUM SCH 40 PVC UNLESS NOTED OTHERWISE, OR AS PER LOCAL CODE REQUIREMENTS.
7. PROVIDE FLEXIBLE STEEL CONDUIT OR LIQUID TIGHT FLEXIBLE STEEL CONDUIT TO ALL VIBRATING EQUIPMENT, INCLUDING HVAC UNITS, TRANSFORMERS, MOTORS, ETC, OR WHERE EQUIPMENT IS PLACED UPON A SLAB ON GRADE.
8. ALL BRANCH CIRCUITS AND FEEDERS SHALL HAVE A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR BONDED TO ALL ENCLOSURES, PULLBOXES, ETC.
9. CONDUIT AND CABLE WITHIN CORRIDORS SHALL BE CONCEALED AND EXPOSED ELSEWHERE, UNLESS NOTED OTHERWISE.
10. ELECTRICAL MATERIALS INSTALLED ON ROOFTOP SHALL BE LISTED FOR NEMA 3R USE. –AND ALL WIRING WITHIN A VENTILATION DUCT SHALL BE LISTED FOR SUCH USE. IN GENERAL WIRING METHODS WITHIN A DUCT SHALL BE AN MC CABLE WITH SMOOTH OR CORRUGATED METAL JACKET AND HAVE NO OUTER COVERING OVER THE METAL JACKET. INTERLOCKED ARMOR TYPE OF MC CABLE IS NOT ACCEPTABLE FOR THIS APPLICATION. CONTRACTOR CAN ALSO USE TYPE MI CABLE IN THE VENTILATION DUCT PROVIDED IT DOES NOT HAVE ANY OUTER COVERINGS OVER THE METAL EXTERIOR.
11. WIRING DEVICES SHALL BE SPECIFICATION GRADE, AND WIRING DEVICE COVER PLATES SHALL BE PLASTIC WITH ENGRAVING AS SPECIFIED.
12. GROUNDING SYSTEM RESISTANCE SHALL BE MEASURED, RECORDED, AND DATED USING MEGGER DET14 OR SIMILAR INSTRUMENT. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION.
13. COORDINATE WITH BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK INVOLVING EXISTING SYSTEMS OR EQUIPMENT IN ORDER TO DETERMINE THE EFFECT, IF ANY, ON OTHER TENANTS WITHIN THE BUILDING, AND TO DETERMINE THE APPROPRIATE TIME FOR PERFORMING THIS WORK.
14. THE CONTRACTOR SHALL BE REQUIRED TO VISIT THE SITE PRIOR TO SUBMITTING BID IN ORDER TO DETERMINE THE EXTENT OF THE EXISTING CONDITIONS.
15. ALL CONDUCTOR ENDS SHALL BE TAGGED AND ELECTRICAL EQUIPMENT LABELED WITH ENGRAVED IDENTIFICATION PLATES.
16. CONTRACTOR IS RESPONSIBLE FOR ALL CONTROL WIRING AND ALARM TIE–INS.

GROUNDING

1. #6 THWN SHALL BE STRANDED #6 COPPER WITH GREEN THWN INSULATION SUITABLE FOR WET INSTALLATIONS.
2. #2 THWN SHALL BE STRANDED #2 COPPER WITH THWN INSULATION SUITABLE FOR WET INSTALLATIONS.
3. #2 BARE TINNED SHALL BE SOLID COPPER TINNED. ALL BURIED WIRE SHALL MEET THIS CRITERIA.
4. ALL LUGS SHALL BE 2–HOLE, LONG BARREL, TINNED SOLID COPPER UNLESS OTHERWISE SPECIFIED, LUGS SHALL BE THOMAS AND BETTS SERIES 548##BE OR EQUIVALENT (IE #2 THWN – 54856BE, #2 SOLID – 54856BE, AND #6 THWN – 54852BE).
5. ALL HARDWARE, BOLTS, NUTS, AND WASHERS SHALL BE 18–8 STAINLESS STEEL. EVERY CONNECTION SHALL BE BOLT–FLAT WASHER–BUSS–LUG–FLAT WASHER–BELLEVILLE WASHER–NUT IN THAT EXACT ORDER. BACK–TO–BACK LUGGING, BOLT–FLAT WASHER–LUG–BUSS–LUG–FLAT WASHER–BELLEVILLE WASHER–NUT, IN THAT EXACT ORDER, IS ACCEPTED WHERE NECESSARY TO CONNECT MANY LUGS TO A BUSS BAR. STACKING OF LUGS, BUSS–LUG–LUG, IS NOT ACCEPTABLE.
6. WHERE CONNECTIONS ARE MADE TO STEEL OR DISSIMILAR METALS, A THOMAS AND BETTS DRAGON TOOTH WASHER MODEL DTWXXX SHALL BE USED BETWEEN THE LUG AND THE STEEL, BOLT–FLAT WASHER–STEEL–DRAGON TOOTH WASHER–LUG–FLAT WASHER–BELEVILE WASHER–NUT.
7. ALL CONNECTIONS, INTERIOR AND EXTERIOR, SHALL BE MADE WITH THOMAS AND BETTS KPOR–SHIELD. COAT ALL WIRES BEFORE LUGGING AND COAT ALL SURFACES BEFORE CONNECTING.
8. THE MINIMUM BEND RADIUS SHALL BE 8 INCHES FOR #6 WIRE AND SMALLER AND 12 INCHES FOR WIRE LARGER THAN #6.
9. ALL CONNECTIONS TO THE GROUND RING SHALL BE EXOTHERMIC WELD.
10. BOND THE FENCE TO THE GROUND RING AT EACH CORNER, AND AT EACH GATE POST WITH #2 SOLID TINNED WIRE. EXOTHERMIC WELD BOTH ENDS.
11. GROUND KITS SHALL BE SOLID COPPER STRAP WITH #6 WIRE 2–HOLE COMPRESSION CRIMPED LUGS AND SHALL BE SEALED ACCORDING TO MANUFACTURER INSTRUCTIONS.
12. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL BE USED.
13. GROUND BARS SHALL BE FURNISHED AND INSTALLED WITH PRE–DRILLED HOLE DIAMETERS AND SPACINGS. GROUND BARS SHALL NEITHER BE FIELD FABRICATED NOR NEW HOLES DRILLED. GROUND LUGS SHALL MATCH THE SPACING ON THE BAR. HARDWARE DIAMETER SHALL BE MINIMUM 3.8 INCH.
14. MGB GROUND CONNECTION SHALL BE EXOTHERMIC WELDED TO THE GROUND SYSTEM.
15. ALL CABLE TRAY AND/OR PLATFORM STEEL SHALL BE BONDED TOGETHER WITH JUMPERS (#6 IN EQUIPMENT ROOM, #2 ELSEWHERE AND HOMERUN).

CABLE TRAY

1. CABLE TRAY SHALL BE MADE OF EITHER CORROSION RESISTANT METAL OR WITH A CORROSION RESISTANT FINISH.
2. CABLE TRAY SHALL BE OF LADDER TRAY TYPE WITH FLAT COVER CLAMPED TO SIDE RAILS.
3. CABLE LADDER SHALL BE SIZED TO FIT ALL CABLES IN ACCORD WITH NEC AND NEMA 11–15–84.
4. CABLE LADDER TRAYS SHALL BE NEMA CLASS 12A BY PW INDUSTRIES, INC OR EQUAL.
5. CABLE LADDER TRAY SHALL BE SUPPORTED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
6. ALL WORKMANSHIP SHALL CONFORM TO THESE REQUIREMENTS AND ALL LOCAL CODES AND STANDARDS TO ENSURE SAFE AND ADEQUATE GROUNDING SYSTEM.

ANTENNA & CABLE NOTES

1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TRANSMISSION CABLES, JUMPERS, CONNECTORS, GROUNDING STRAPS, ANTENNAS, MOUNTS AND HARDWARE. ALL MATERIALS SHALL BE INSPECTED BY THE CONTRACTOR FOR DAMAGE UPON DELIVERY. JUMPERS SHALL BE SUPPLIED AT ANTENNAS AND EQUIPMENT INSIDE SHELTER COORDINATE LENGTH OF JUMP CABLES WITH EVERSOURCE. COORDINATE AND VERIFY ALL OF THE MATERIALS TO BE PROVIDED WITH EVERSOURCE PRIOR TO SUBMITTING BID AND ORDERING MATERIALS.
2. AFTER INSTALLATION, THE TRANSMISSION LINE SYSTEM SHALL BE PIM/SWEEP TESTED FOR PROPER INSTALLATION AND DAMAGE WITH ANTENNAS CONNECTED. CONTRACTOR TO OBTAIN LATEST TESTING PROCEDURES FROM EVERSOURCE PRIOR TO BIDDING.
3. ANTENNA CABLES SHALL BE COLOR CODED AT THE FOLLOWING LOCATIONS:
   – AT THE ANTENNAS.
   – AT THE WAVEGUIDE ENTRY PLATE ON BOTH SIDES OF THE EQUIPMENT SHELTER WALL.
   – JUMPER CABLES AT THE EQUIPMENT ENTER.
4. SYSTEM INSTALLATION:
   THE CONTRACTOR SHALL INSTALL ALL CABLES AND ANTENNAS TO THE MANUFACTURER'S SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR THE PROCUREMENT AND INSTALLATION OF THE FOLLOWING:
   – ALL CONNECTORS, ASSOCIATED CABLE MOUNTING, AND GROUNDING HARDWARE.
   – WALL MOUNTS, STANDOFFS, AND ASSOCIATED HARDWARE.
   – 1/2 INCH HELIAX ANTENNA JUMPERS OF APPROPRIATE LENGTHS.
5. MINIMUM BENDING RADIUS FOR COAXIAL CABLES:
   – 7/8 INCH, RMIN = 15 INCHES
   – 1 5/8 INCH, RMIN = 25 INCHES
6. CABLE SHALL BE INSTALLED WITH A MINIMUM NUMBER OF BENDS WHERE POSSIBLE. CABLE SHALL NOT BE LEFT UNTERMINATED AND SHALL BE SEALED IMMEDIATELY AFTER BEING INSTALLED.
7. ALL CABLE CONNECTIONS OUTSIDE SHALL BE COVERED WITH WATERPROOF SPLICING KIT.
8. CONTRACTOR SHALL VERIFY EXACT LENGTH AND DIRECTION OF TRAVEL IN FIELD PRIOR TO CONSTRUCTION.
9. CABLE SHALL BE FURNISHED WITHOUT SPLICES AND WITH CONNECTORS AT EACH END.

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458–2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	TH

REV	DATE	DESCRIPTION
0	09/15/20	ISSUED FOR FILING

STATE OF CONNECTICUT · MARK P. STILES · 24358 · LICENSED PROFESSIONAL ENGINEER
09/15/2020

NEW LONDON AWC
63 MYROCK AVE
WATERFORD, CT 06385

SHEET TITLE
NOTES
& SPECIFICATIONS

SHEET NUMBER
N-2

SYMBOLS

●	EXOTHERMIC CONNECTION
■	COMPRESSION CONNECTION
⏚●	5/8"ø x 10'-0" COPPER CLAD STEEL GROUND ROD.
⏚◉	TEST GROUND ROD WITH INSPECTION SLEEVE
- - -	GROUNDING CONDUCTOR
(A)	KEY NOTES
CHAINLINK FENCE	X X X X X
WOOD FENCE	
LEASE AREA	
ICE BRIDGE	
CABLE TRAY	
GAS LINE	G G G G G
UNDERGROUND ELECTRICAL/TELCO	E/T E/T E/T E/T
UNDERGROUND ELECTRICAL/CONTROL	E/C E/C E/C E/C
UNDERGROUND ELECTRICAL	E E E E E
UNDERGROUND TELCO	T T T T T
PROPERTY LINE (PL)	

ABBREVIATIONS

AC	ALTERNATING CURRENT	MGB	MASTER GROUNDING BAR
AIC	AMPERAGE INTERRUPTION CAPACITY	MIN	MINIMUM
ANI	AUXILIARY NETWORK INTERFACE	MW	MICROWAVE
ATM	ASYNCHRONOUS TRANSFER MODE	MTS	MANUAL TRANSFER SWITCH
ATS	AUTOMATIC TRANSFER SWITCH	NEC	NATIONAL ELECTRICAL CODE
AWG	AMERICAN WIRE GAUGE	OC	ON CENTER
AWS	ADVANCED WIRELESS SERVICES	PP	POLARIZING PRESERVING
BATT	BATTERY	PCU	PRIMARY CONTROL UNIT
BBU	BASEBAND UNIT	PDU	PROTOCOL DATA UNIT
BTC	BARE TINNED COPPER CONDUCTOR	PWR	POWER
BTS	BASE TRANSCEIVER STATION	RECT	RECTIFIER
CCU	CLIMATE CONTROL UNIT	RET	REMOTE ELECTRICAL TILT
CDMA	CODE DIVISION MULTIPLE ACCESS	RMC	RIGID METALLIC CONDUIT
CHG	CHARGING	RF	RADIO FREQUENCY
CLU	CLIMATE UNIT	RUC	RACK USER COMMISSIONING
COMM	COMMON	RRH	REMOTE RADIO HEAD
DC	DIRECT CURRENT	RRU	REMOTE RADIO UNIT
DIA	DIAMETER	RWY	RACEWAY
DWG	DRAWING	SFP	SMALL FORM-FACTOR PLUGGABLE
EC	ELECTRICAL CONDUCTOR	SIAD	SMART INTEGRATED ACCESS DEVICE
EMT	ELECTRICAL METALLIC TUBING	SSC	SITE SOLUTIONS CABINET
FIF	FACILITY INTERFACE FRAME	T1	1544KBPS DIGITAL LINE
GEN	GENERATOR	TDMA	TIME-DIVISION MULTIPLE ACCESS
GPS	GLOBAL POSITIONING SYSTEM	TMA	TOWER MOUNT AMPLIFIER
GSM	GLOBAL SYSTEM FOR MOBILE	TVSS	TRANSIENT VOLTAGE SUPPRESSION SYSTEM
HVAC	HEAT/VENTILATION/AIR CONDITIONING	TYP	TYPICAL
ICF	INTERCONNECTION FRAME	UMTS	UNIVERSAL MOBILE TELECOMMUNICATION SYSTEM
IGR	INTERIOR GROUNDING RING (HALO)	UPS	UNINTERRUPTIBLE POWER SUPPLY (DC POWER PLANT)
LTE	LONG TERM EVOLUTION		

EVERSOURCE ENERGY

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NEW LONDON AWC
63 MYROCK AVE
WATERFORD, CT 06385

SHEET TITLE

NOTES
& SPECIFICATIONS

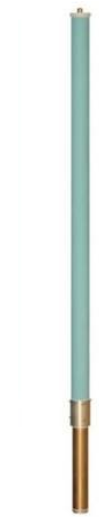
SHEET NUMBER

N-3

REFERENCE CUTSHEETS

VHF Omni Antennas (160-222 MHz)

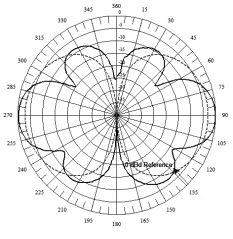
		160-174 MHz						217-222 MHz									
	Model Number	**DS1G03F36U-N**	**DS1G03F36U-D**	**DS1G06F36U-N**	**DS1G06F36U-D**	**DS1G03F36D-N**	**DS1G03F36D-D**	**DS2C00F36U-N**	**DS2C00F36U-D**	**DS2C03F36U-N**	**DS2C03F36U-D**	**DS2C06F36U-N**	**DS2C06F36U-D**	**DS2C00F36D-N**	**DS2C00F36D-D**	**DS2C03F36D-N**	**DS2C03F36D-D**
	Input Connector	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN
	Type	Single		Single		Dual		Single		Single		Single		Dual		Dual	
ELECTRICAL	**Bandwidth**, MHz	14		14		14		5		5		5		5		5	
ELECTRICAL	**Power**, Watts	500		500		350		500		500		500		350		350	
ELECTRICAL	**Gain**, dBd	3		6		3		0		3		6		0		3	
ELECTRICAL	**Horizontal Beamwidth**, degrees	360		360		360		360		360		360		360		360	
ELECTRICAL	**Vertical Beamwidth**, degrees	30		16		30		60		30		16		60		30	
ELECTRICAL	**Beam Tilt**, degrees	0		0		0		0		0		0		0		0	
ELECTRICAL	**Isolation (minimum)**, dB	N/A		N/A		30		N/A		N/A		N/A		30		30	
MECHANICAL	**Number of Connectors**	1		1		2		1		1		1		2		2	
MECHANICAL	**Flat Plate Area**, ft^2	2.10		3.63		3.69		1.28		1.64		2.58		2.09		3.08	
MECHANICAL	**Lateral Windload Thrust**lbf	88		152		155		54		69		109		88		129	
MECHANICAL	**Wind Speed Rating without ice**, mph	190		150		150		250		225		175		190		160	
MECHANICAL	**Mounting Hardware** included	DSH3V3R		DSH3V3N		DSH3V3N		DSH2V3R		DSH2V3R		DSH3V3N		DSH3V3R		DSH3V3N	
DIMENSIONS	**Length**, ft(m)	12.7 (3.9)		21.9 (6.7)		22.3 (6.8)		7.7 (2.3)		9.9 (3)		15.6 (4.8)		12.6 (3.8)		18.6 (5.7)	
DIMENSIONS	**Radome O.D.**, in(cm)	3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)	
DIMENSIONS	**Mast O.D.**, in(cm)	2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)	
DIMENSIONS	**Net Weight** w/o bracket, lb(kg)	37 (16.8)		60 (27.2)		63 (28.6)		19 (8.6)		26 (11.8)		47 (21.3)		40 (18.1)		70 (31.8)	
DIMENSIONS	**Shipping Weight**, lb(kg)	67 (30.4)		90 (40.8)		93 (42.2)		39 (17.7)		56 (25.4)		77 (34.9)		70 (31.8)		100 (45.4)	



DS2C03F36D-D

VERTICAL PATTERNS

DS1G03F36U-N
DS1G03F36U-D



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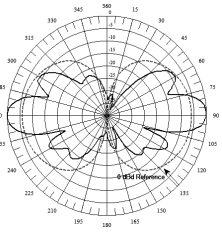

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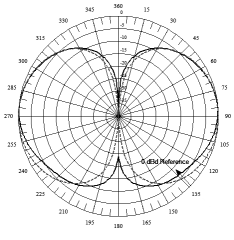

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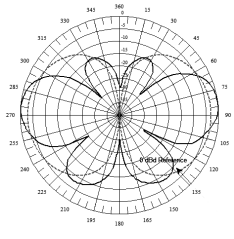

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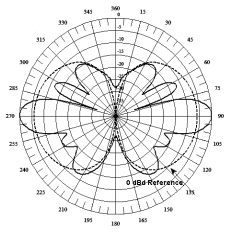
DS2C06F36U-D



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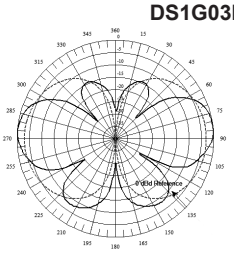

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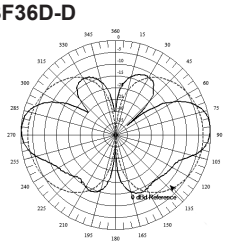

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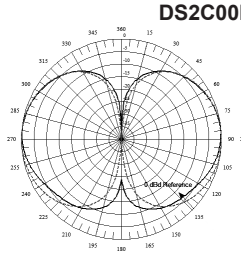

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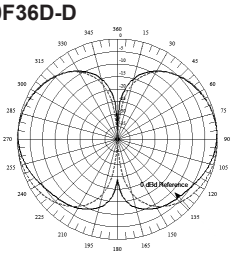

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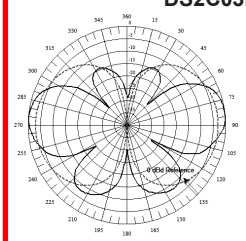

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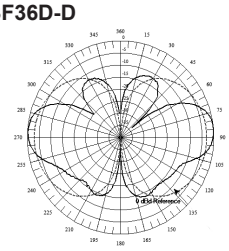

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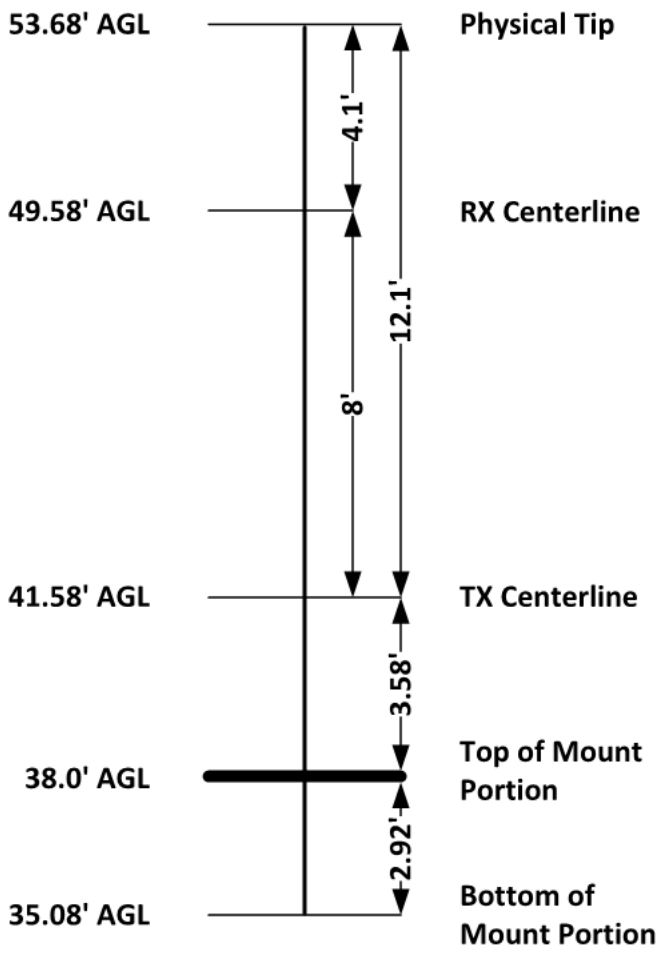
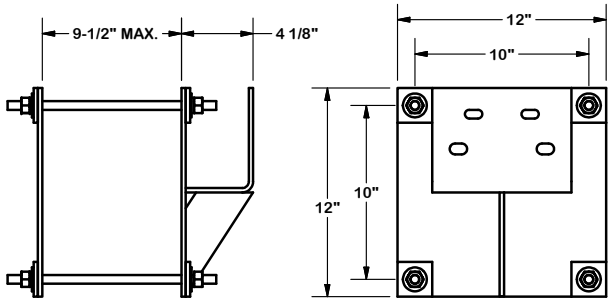
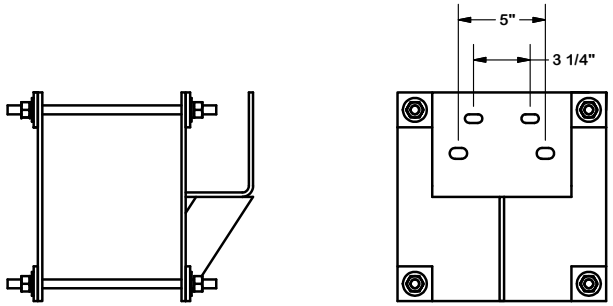
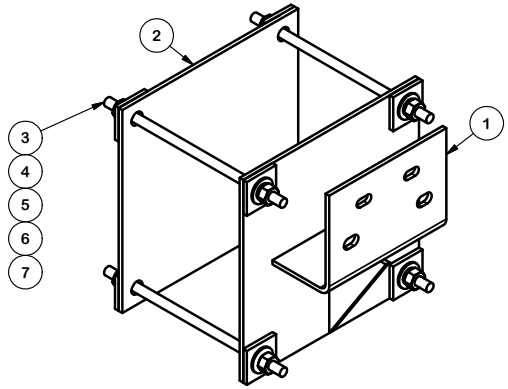
dBSpectra DS2C03F36 (18.6' Total)

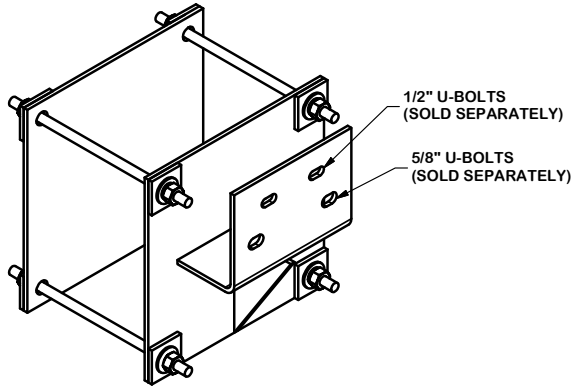


PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-SP22	HEAVY WALL MOUNT BRACKET		16.16	32.32
2	2	SP-221BP	12" xX 12" WALL MOUNT BACKING PLATE	12 in	10.10	20.19
3	8	G12R-12	1/2" x 12" THREADED ROD (HDG.)		0.35	2.81
4	16	SQW12	1/4" x 2" FLAT STOCK	2 in	0.27	4.26
5	16	G12FW	1/2" HDG USS FLATWASHER		0.03	0.55
6	14	G12LW	1/2" HDG LOCKWASHER		0.01	0.19
7	16	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.15
					TOTAL WT. #	64.01









TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: HOLLOW WALL KIT

SITE PRO 1 — A valmont COMPANY

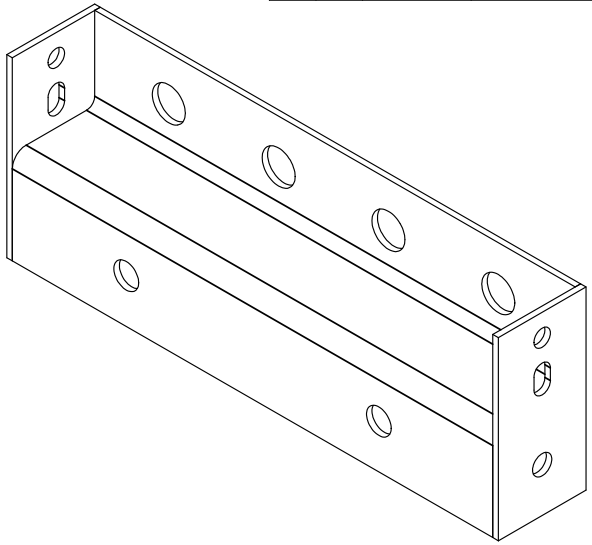
Engineering Support Team: 1-888-753-7446

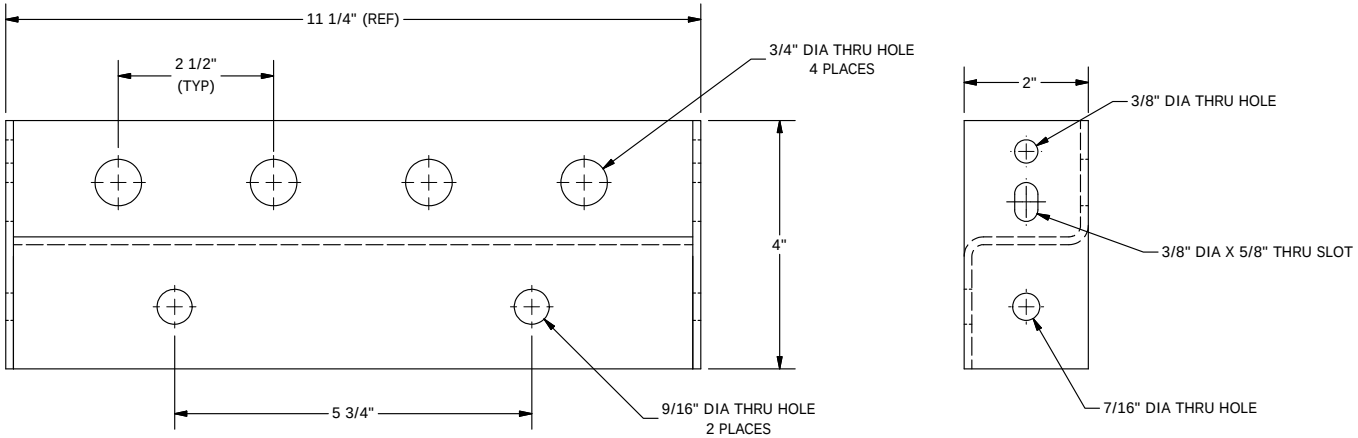
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 5/25/2011		SP221

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 6/2/2011	SP221

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	SP1586	WALL MOUNT BRACKET FOR 4 RUNS OF COAX	11 1/4 in	2.81	2.81





REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED SPACING ON 9/16" HOLES		CEK	4/30/2015

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
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DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

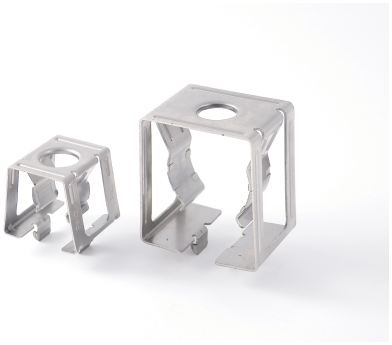
DESCRIPTION
WALL MOUNT BRACKET FOR 4 RUNS
GALVANIZED

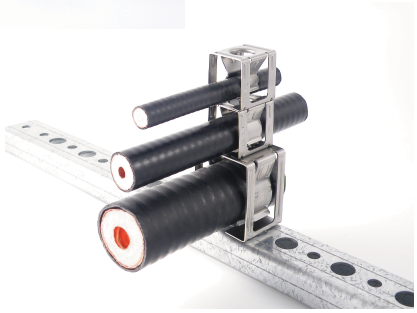
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
5080	KC8 5/16/2012		SP1586

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 4/30/2015	SP1586

SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

MonoBloc Stackable Snap-In Hangers (SIC1, SIC2, SIC3, SIC4)





Features:

- Allows cable attachment without the need for hardware
- One-hand mounting
- Stack up to four 1/2”, 7/8” or 1-1/4” cables or three 1-5/8” cables

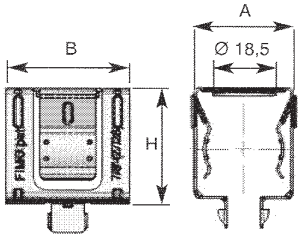
Construction:

- 301 stainless steel

Design Criteria:

- Can be used outdoors or indoors

Part #	AT&T	Cable Size	U of M	A	B	H
SIC1	CEQ.11469	1/2”	10 pack	1-1/4”	1-9/16”	1-1/2”
SIC2	ANT.13860	7/8”	10 pack	1-1/4”	1-9/16”	1-1/2”
SIC3	ANT.13859	1-1/4”	10 pack	2-1/4”	1-3/4”	2-5/8”
SIC4	ANT.12719	1-5/8”	10 pack	2-1/4”	1-3/4”	2-5/8”



ATTACHMENT C – PROOF OF DELIVERY NOTICE

Ref: CT587100-ES-127 Date: 14Oct20
Dep: BL GRAPHICS Wgt: 1.15 LBS

DV:

SHIPPING:	0.00
SPECIAL:	0.00
HANDLING:	0.00
0.00 TOTAL:	0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3346 5537

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 14OCT20
ACTWGT: 1.15 LB
CAD: 0765627/CAFE3407

BILL THIRD PARTY

TO

CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051
REF: CT587100-ES-127

DEPT: BL GRAPHICS

56BC2/A27E/05A2

FedEx Express

J2010191106011av

THU - 15 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **9151 3346 5537**

00 BDLA

06051
CT-US **BDL**

Ref: CT587100-ES-127 Date: 140ct20
Dep: BL GRAPHICS Wgt: 1.15 LBS

DV:

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
0.00 TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3346 5526

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 140CT20
ACTWGT: 1.15 LB MAN
CAD: 0765627/CAFE3407

BILL THIRD PARTY

TO **ABBY PIERSALL, AICP**
TOWN OF WATERFORD
15 ROPE FERRY ROAD

WATERFORD CT 063852886
(860) 444-5813
DEPT: BL GRAPHICS
REF: CT587100-ES-127

56DC2/A27E/05A2

FedEx
Express

J2010191106011uv

THU - 15 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **9151 3346 5526**

00 SKKA

06385
CT-US **BDL**

Ref: CT587100-ES-127 Date: 140ct20
Dep: BL GRAPHICS Wgt: 1.15 LBS

DV:

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
0.00 TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3346 5515

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 140CT20
ACTWGT: 1.15 LB
CAD: 0765627/CAFE3407

BILL THIRD PARTY

TO **HONORABLE ROB BRULE**
TOWN OF WATERFORD
15 ROPE FERRY ROAD

WATERFORD CT 063852886
(860) 444-5813
REF: CT587100-ES-127
DEPT: BL GRAPHICS

56DC2/A27E/05A2

FedEx
Express

J2010191106011W

TRK# 0201 **9151 3346 5515**

THU - 15 OCT 10:30A
PRIORITY OVERNIGHT

00 SKKA

06385
CT-US **BDL**

ATTACHMENT D – POWER DENSITY REPORT

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
603-644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

ES-127 – New London AWC

63 Myrock Avenue

Waterford, CT 06385

September 22, 2020

Table of Contents

1. Introduction....1
2. FCC Guidelines for Evaluating RF Radiation Exposure Limits....2
3. Power Density Calculation Methods....3
4. Proposed Antenna Configuration....3
5. Measurement Procedure....4
6. Surveyed and Calculated % MPE Results....5
7. Conclusion....7
8. Statement of Certification....7
Attachment A: References....8
Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)....9
Attachment C: Eversource Antenna Data Sheet and Electrical Patterns....11

List of Tables

Table 1: Survey Information....1
Table 2: Eversource Antenna Configuration (Proposed)....3
Table 3: Instrumentation Information....4
Table 4: Measured and Calculated % MPE Results....5
Table 5: FCC Limits for Maximum Permissible Exposure (MPE)....9

List of Figures

Figure 1: View of ES-127 New London AWC....1
Figure 2: Measurement Points....6
Figure 3: Graph of FCC Limits for Maximum Permissible Exposure (MPE)....10

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed Eversource installation on the rooftop of 63 Myrock Avenue in Waterford, CT. Eversource is proposing to install one omnidirectional antenna as part of its 220 MHz communications system.

This report considers the proposed antenna configuration as detailed by Eversource along with % MPE (Maximum Permissible Exposure) measurements around the existing building to determine FCC compliance of the facility.

Figure 1: View of ES-127 New London AWC

Site Address	63 Myrock Avenue
Latitude	41° 20' 9.80" N
Longitude	72° 6' 56.40" W
Site Elevation AMSL	44’
Survey Engineer	Marc Salas
Survey Date/Time	6/25/2020; 9:00 AM – 10:00 AM

Table 1: Survey Information

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached “FCC Limits for Maximum Permissible Exposure (MPE)” in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. Power Density Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65, and Connecticut Siting Council recommendations:

$$\text{Power Density} = \left(\frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power = 1.64 x ERP

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and full power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. As a result, the calculated power density and corresponding % MPE levels reported below are much higher than the actual levels will be from the final installation.

4. Proposed Antenna Configuration

Table 2 below lists the technical details of the proposed Eversource installation. These parameters are applied to the above calculation methods in order to calculate the % MPE values of the proposed equipment.

Operator	Antenna Model	TX Freq. (MHz)	Ant Gain (dBd)	Power ERP (Watts)	Number of Channels	Vertical Beamwidth	Length (ft)	Antenna Centerline Height (ft)
Eversource	dBSpectra DS2C03F36D	217	3	124	4	30°	18.6	41.6

Table 2: Eversource Antenna Configuration (Proposed)[1] [2]

[1] Transmit power assumes 0 dB of cable loss.

[2] Transmit antenna height listed for the proposed 217 MHz antenna is based on the Black & Veatch Structural Modification Report dated April 30, 2020 and the Black & Veatch site drawings dated September 15, 2020 (Rev. 0). The proposed antenna consists of two internally stacked antennas – upper is for receive, lower is for transmit. Due to the unavailability of the digital pattern for this specific antenna, the pattern of a like antenna was substituted in the calculations.

5. Measurement Procedure

Frequencies from 300 KHz to 50 GHz were measured using the Narda Probe EA 5091, E-Field, shaped, FCC probe in conjunction with the NBM550 survey meter. The EA 5091 probe is “shaped” such that in a mixed signal environment (i.e.: more than one frequency band is used in a particular location), it accurately measures the percent of MPE.

From FCC OET Bulletin No. 65 - Edition 97-01 – “A useful characteristic of broadband probes used in multiple-frequency RF environments is a frequency-dependent response that corresponds to the variation in MPE limits with frequency. Broadband probes having such a "shaped" response permit direct assessment of compliance at sites where RF fields result from antennas transmitting over a wide range of frequencies. Such probes can express the composite RF field as a percentage of the applicable MPEs”.

Probe Description - As suggested in FCC OET Bulletin No. 65 - Edition 97-01, the response of the measurement instrument should be essentially isotropic, (i.e., independent of orientation or rotation angle of the probe). For this reason, the Narda EA 5091 probe was used for these measurements.

Sampling Description - At each measurement location, a spatially averaged measurement is collected over the height of an average human body. The NBM550 survey meter performs a time average measurement while the user slowly moves the probe over a distance range of 20 cm to 200 cm (about 6 feet) above ground level. The results recorded at each measurement location include average values over the spatial distance.

Instrumentation Information - A summary of specifications for the equipment used is provided in the table below.

Manufacturer	Narda Microwave			
Probe	EA 5091, Serial# 01116			
Calibration Date	May 2020			
Calibration Interval	24 Months			
Meter	NBM550, Serial# E-1069			
Calibration Date	May 2020			
Calibration Interval	24 Months			
Probe Specifications	**Frequency Range**	**Field Measured**	**Standard**	**Measurement Range**
	300 KHz-50 GHz	Electric Field	U.S. FCC 1997 Occupational/Controlled	0.2 – 600 % of Standard

Table 3: Instrumentation Information

Instrument Measurement Uncertainty - The total measurement uncertainty of the NARDA measurement probe and meter is no greater than ±3 dB (0.5% to 6%), ±1 dB (6% to 100%), ±2 dB (100% to 600%). The factors which contribute to this include the probe’s frequency response deviation, calibration uncertainty, ellipse ratio, and isotropic response[3]. Every effort is taken to reduce the overall uncertainty during measurement collection including pointing the probe directly at the likely highest source of emissions.

[3] For further details, please refer to Narda Safety Test Solutions NBM550 Probe Specifications, pg. 64
http://www.narda-sts.us/pdf_files/DataSheets/NBM-Probes_DataSheet.pdf

6. Surveyed and Calculated % MPE Results

Measured and calculated results and a description of each survey location are detailed in the table below. Measurements were recorded on June 25, 2020 between 9:00 AM and 10:00 AM. The calculated % MPE contribution from the proposed equipment was then added to the measured % MPE values in the "Composite % MPE" column. These calculated values incorporate the antenna pattern of the antenna model specified by Eversource (or a similar antenna) to determine the "Off Beam Loss" factor shown in the power density formula from Section 4. All % MPE values are in reference to the FCC Uncontrolled/General Population exposure limit.

Table 4 below lists 21 measurements recorded in the vicinity of the site. The highest spatially averaged measurement was 8.39% (Average Uncontrolled / General Population MPE) and was recorded by the NW corner of the building (Location 2). The highest composite (measured + calculated) % MPE value is calculated to be 12.08% (Average Uncontrolled / General Population) and is also calculated to occur at Location 2.

Meas. Location	Location Description	Latitude	Longitude	Dist. From Site (feet)	Measured % MPE (Uncontrolled / General)	Calculated % MPE (Eversource Proposed)	Composite % MPE (Uncontrolled / General)
1	NW of building	41.33605	-72.11627	165	8.35%	2.41%	10.76%
2	**NW corner of building**	**41.33607**	**-72.11606**	**109**	**8.39%**	**3.69%**	**12.08%**
3	West of building	41.33578	-72.11608	152	4.28%	2.47%	6.74%
4	West of building	41.33555	-72.11598	202	1.73%	1.68%	3.41%
5	SW corner of building	41.33537	-72.11586	256	< 1.00%	1.19%	< 2.19%
6	South side of building	41.33543	-72.11558	229	1.89%	1.46%	3.35%
7	South of building, parking lot	41.33529	-72.11531	297	4.41%	0.95%	5.36%
8	South of building, parking lot	41.33504	-72.11518	393	6.32%	0.56%	6.88%
9	South of building, parking lot	41.33481	-72.11497	495	5.24%	0.36%	5.60%
10	South of building, parking lot	41.33482	-72.11556	454	5.16%	0.42%	5.58%
11	South of building, parking lot	41.33501	-72.11577	382	4.88%	0.59%	5.46%
12	SE of building	41.33519	-72.11482	394	< 1.00%	0.57%	< 1.57%
13	East of building at parking lot crosswalk	41.33573	-72.11506	206	1.37%	2.01%	3.38%
14	East of building	41.33556	-72.11459	345	3.83%	0.75%	4.57%
15	East of building	41.33601	-72.11482	234	1.70%	1.62%	3.32%
16	NE of building, near parking lot stairs	41.33643	-72.11540	155	2.48%	3.56%	6.04%
17	East of building near main entrance	41.33595	-72.11545	71	4.13%	6.41%	10.54%
18	North of building	41.33654	-72.11597	194	5.25%	2.22%	7.47%
19	North of building, by security gate	41.33659	-72.11629	259	6.16%	1.28%	7.44%
20	Atlantic Broadband parking lot	41.33719	-72.11615	436	1.05%	0.47%	1.52%
21	Myrock Avenue cul-de-sac	41.33677	-72.11492	333	1.15%	0.80%	1.95%

Table 4: Measured and Calculated % MPE Results [4]

[4] Due to measurement uncertainty at low levels (See Table 3), any readings outside the measurement range of the probe (< 1.00 % FCC General Population/Uncontrolled MPE) are noted as such.

Figure 2 below is an aerial view[5] of the rooftop location and the surrounding area, along with the measurement locations listed in Table 4.

Figure 2: Measurement Points

[5] Map showing location of telecommunications facility and the surrounding area. *Google Earth*, https://earth.google.com/web/.

7. Conclusion

A number of accessible areas around the building at 63 Myrock Avenue in Waterford, CT were surveyed and found to be well within the mandated General Population/Uncontrolled limits for Maximum Permissible Exposure, as delineated in the Federal Communications Commission's Radio Frequency exposure rules published in 47 CFR 1.1307(b)(1)-(b)(3).

The highest spatially averaged % MPE measurement of all surveyed points based on the 1997 FCC standard for exposure to the general population is 8.39% MPE. This measurement was recorded at Location 2 by the west of the building.

The highest composite (measured + calculated) power density is **12.08% of the FCC General Population MPE limit** with the proposed Eversource equipment is also calculated to occur at Location 2 west of the building.

The above analysis concludes that RF exposure at ground level around the building, both currently and with the proposed antenna installation, will be below the maximum power density limits as outlined by the FCC in the OET Bulletin 65 Ed. 97-01.

As noted previously, the calculated % MPE levels are more conservative (higher) than the actual levels will be from the finished installation.

8. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in FCC OET Bulletin 65 Edition 97-01, IEEE Std. C95.1, and IEEE Std. C95.3.

Marc Salas — September 22, 2020

Report Prepared By: Marc Salas
RF Engineer
C Squared Systems, LLC — Date

Keith Vellante — September 22, 2020

Reviewed/Approved By: Keith Vellante
Director of RF Services
C Squared Systems, LLC — Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[6]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[7]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 5: FCC Limits for Maximum Permissible Exposure (MPE)

[6] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[7] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

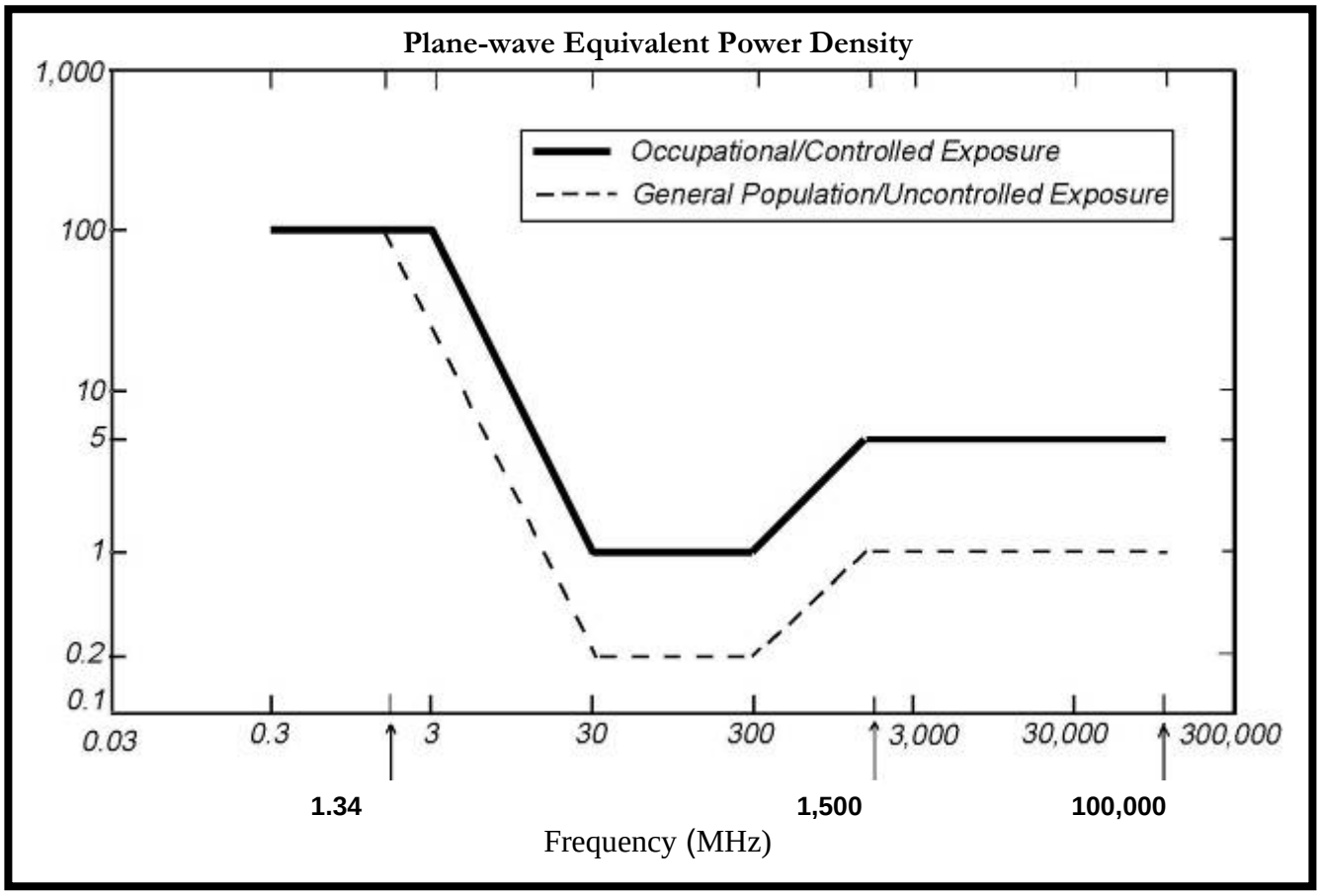
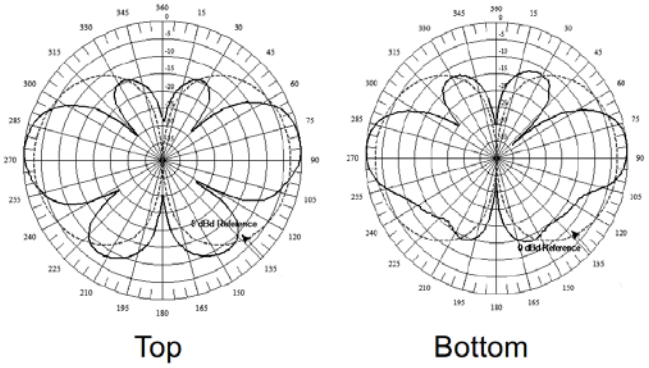


Figure 3: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Eversource Antenna Data Sheet and Electrical Patterns

217 MHz	
Manufacturer:	dbSpectra
Model #:	DS2C03F36D
Frequency Band:	217 - 222 MHz
Gain:	3 dBd
Vertical Beamwidth:	30°
Horizontal Beamwidth:	360°
Polarization:	Vertical-Polarization
Length:	18.6’

DS2C03F36D-N
DS2C03F36D-D



Top Bottom

ATTACHMENT E - STRUCTURAL ANALYSIS

STRUCTURAL MODIFICATION OF PROPOSED ANTENNA MOUNT AND EXISTING PENTHOUSE WALL

NEW LONDON AWC
63 MYROCK AVENUE
WATERFORD, CT 06385

B&V PROJECT NO. 403093.2000.2200
PROJECT NAME: LMR EPC PHASE 2.1

PREPARED FOR

EVERSOURCE ENERGY

107 SELDEN STREET
BERLIN, CT 06037

09/15/2020
Joshua J. Riley, P.E.
Professional Engineer

BLACK & VEATCH
Building a world of difference.

BLACK & VEATCH CORPORATION
6800 WEST 115TH ST, SUITE 2292
OVERLAND PARK, KANSAS 66211

April 30, 2020

TABLE OF CONTENTS

1. PURPOSE

2. REFERENCES

3. ASSUMPTIONS

4. CONCLUSION

5. ANALYSIS & DESIGN

5.1 Structural Modification of Proposed Antenna Mount

5.2 Structural Modification of Existing Penthouse Wall

6. ATTACHMENTS

BLACK & VEATCH

Owner:	EVERSOURCE	Computed By:	T. Eakkalak
Site Name:	NEW LONDON AWC	Date:	4/30/2020
Project No.	403093.2000.2200	Verified By:	L. Meyer
Title:	STRUCTURAL MODIFICATION OF PROPOSED ANTENNA MOUNT AND EXISTING PENTHOUSE WALL	Date:	5/12/2020

1. PURPOSE

The purpose of this calculation is to evaluate the proposed antenna mount and the modified existing penthouse wall to be adequate under proposed loading configuration.

2. REFERENCES

A. 2018 Connecticut State Building Code

B. International Building Code, IBC 2015

C. Structural Standard for Antenna Supporting Structures and Antennas, TIA-222-H

D. American Society of Civil Engineers, ASCE 7-10

E. American Institute of Steel Construction, 14th Edition

F. National Design Specification for Wood Construction, 15th Edition

G. Site Survey Report Completed by Black & Veatch Corp., dated 10/2/2018

H. Construction Drawings (Rev. B) Completed by Black & Veatch Corporation, dated 09/14/2020

I. Site Photos

3. ASSUMPTIONS

- Per Steve Florio of Eversource, the penthouse walls are wood frame construction. Therefore, the existing penthouse wall is assumed to be 2x4 framing spaced at 16" on center, with 1/2" Plywood wall sheathing.

- The wood material is assumed to be Douglas Fir - Larch (G = 0.50).

- Atmospheric Ice conditions were ignored when analyzing the wall.

4. CONCLUSION

Design Criteria based on: **2018 Connecticut State Building Code**

Wind			**Ice**		
Wind Speed:	145	mph	Ice Thickness:	0.75	inch
Exposure Category:	C		Ice Wind:	50	mph
Topographic Factor K_{zt}:	1.00				
Risk Category:	III		**Seismic**	(Neglect)	
			Seismic Importance Factor:	1.00	
			Seismic S_{DS}:	0.171g	
			Seismic Design Category:	B	

4.1 Structural Modification of Proposed Antenna Mount

Governing Load Combination:	1.2DL + 1.0LL + 1.0WL (270 DEG)	
Max Stress Ratio on Proposed Pipe Mast: Pipe 3.0 STD:	10.2%	*
Governing Load Combination:	Envelope	
Max Stress Ratio on Proposed Wall Mount Anchorage:	13.7%	*
The Proposed Antenna Mount Result:	**SUFFICIENT**	

Use Pipe 3.0STD. (O.D. 3.5") pipe x 5'-0" long min., with Valmont Site Pro 1 : SP221 wall mount bracket with backer plates. Anchor (4) 1/2" Dia. Thru - Bolts (SAE J429 Grade 2, F_u = 74ksi) per bracket drill to the existing penthouse wall or EOR approved equivalent.

* Note: The % ratio rating per TIA-222-H Section 15.5.

4.2 Structural Modification of Existing Penthouse Wall

Governing Load Combination:	0.6DL + 0.6WL (270 DEG)
Max Stress Ratio Bending Stress on Modified Wood Frame :	63.4%
Governing Load Combination:	0.6DL + 0.6WL (270 DEG)
Max Stress Ratio Shear Stress on Modified Wood Frame :	81.7%
Governing Load Combination:	0.6DL + 0.6WL (270 DEG)
Max Stress Ratio Bending Stress on Proposed Horizontal Wood Frame 4x4:	36.5%
Governing Load Combination:	1.0DL + 0.6WL (270 DEG)
Max Stress Ratio Shear Stress on Proposed Horizontal Wood Frame 4x4:	53.3%
The Modified Penthouse Wall Result:	***SUFFICIENT***

The structural rating is conditional on the installation of Wood member size (2) 2x4 (actual size 2.5"x3.5") x 7' - 0" (VIF.) long min. for built up existing column wall and (4) 4x4 (actual size 3.5"x3.5") x 1' - 3" (VIF.) long min. horizontal frame with wood material Douglas Fir - Larch (G = 0.50) or EOR approved equivalent.

4. CONCLUSION (CONTINUED)

4.3 Disclaimers

This calculation is based on the loading and equipment position provided by client. If the installed loading and/or equipment position are different from the calculation, the calculation is considered invalid.

This certification assumes that all structural members are in good condition. Contractor shall inspect the condition of all relevant members and connectors and report any perceived deficiencies to the engineer prior to installation of any new equipment.

The contractor shall be responsible for the means and methods of construction. It is contractor's responsibility to provide necessary intermediate or temporary support during construction.

This analysis is based on the previously stated assumptions. Contractor should verify the validity of the assumptions prior to construction. If those assumptions are incorrect this analysis is invalid, and the contractor shall cease work and contact the EOR immediately.

Summary of Final Loading

Eversource's Loading

Final Antenna / Equipment							
Equipment Owner	Equipment Elevation (ft)	Mount Location	Position	Type	Quantity	Manufacturer	Model
Eversource	**44.5**	**Pipe Mount**	**-**	**Omni**	**1**	**dbSpectra**	**(P) dbSpectra DS2C03F36D**

Note:
(P) = Proposed Equipment

5. ANALYSIS & DESIGN

5.1 Structural Modification of Proposed Antenna Mount

Equipment Dead Loads: **EVERSOURCE'S LOADING**

(P) dbSpectra DS2C03F36D	**100.0 lbs**

Owner:	EVERSOURCE	Computed By:	T. Eakkalak
Site Name:	NEW LONDON AWC	Date:	4/30/2020
Project No.	403093.2000.2200	Verified By:	L. Meyer
Title:	STRUCTURAL MODIFICATION OF PROPOSED ANTENNA MOUNT AND EXISTING PENTHOUSE WALL	Date:	5/12/2020

BLACK & VEATCH

Wind Pressure per ASCE 7-10 / IBC 2012 / IBC 2015 / TIA-222-H

	ASCE 7-10 Section #
a. Ultimate Velocity Pressure, $q_{z \text{ or } } q_h$	29.3.2
Basic Wind Speed, Vult = **145** mph	Fig. 26.5-1A
$qz = 0.00256\ Kz\ Kzt\ Kd\ Ke\ Ks\ V^2$	TIA-222-H
= 0.00256 x 1.12 x 1.00 x 0.95 x 1.00 x 1.00 x 145.00^2	Sec. 2.6.11.6
qz = 57.30 psf	
b. Velocity pressure coefficient, Kz	29.3.1
$Kz = 2.01\ (z/z_g)^{2/\alpha}$	
Exposure Category = **C**	
= 2.01 (56 / 900^(2/9.5))	
Kz = 1.12	
Height above Ground Level, z = **56** ft	Table 29.3-1
α = 9.50	
z_g = 900.00 ft	
c. Topographic Factor, Kzt	26.8.2
H = **15** ft	
μ = 0.00	Fig. 26.8-1
γ = 0.00	
Hill Shape **Flat Terrain**	
K_1 = 0.00	
Crest Type **Upwind**	
$K_2 = (1 - x / \mu Lh)$	
Distance Upwind of crest, Lh = **15** ft	
= [1 - 15 / (0.0 x 15)]	
K_2 = 0.00	
Distance Upwind to Bldg Site, x = **15** ft	
$K_3 = e^{(\gamma z / Lh)}$	
$Kzt = [\ 1 + K_1 K_2\ K_3\ ]^2$	Eq. 26.8-1
= e^-(0.0 x 56 / 15)	
= [1 + 0.00 x 0.00 x 0.00]^2	
K_3 = 0.00	
Kzt = 1.00	
d. Wind Directionality Factor, Kd	Table 26.6-1
(7) Chimney, Tank & Similar Structures - Round Shape	
Kd = 0.95	
e. Ground Elevation Factor, Ke	TIA-222-H Table 2-6
Ke = **1.00**	
f. Rooftop Wind Speed-up Factor, Ks	TIA-222-H Sec. 2.6.7
Ks = **1.00**	
g. Structure Risk Category **III**	Table 1.5-1
h. Gust Effect Factor, G	**29.5.1**
GCr = **1.90**	

REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL.

Owner:	EVERSOURCE	Computed By:	T. Eakkalak
Site Name:	NEW LONDON AWC	Date:	4/30/2020
Project No.	403093.2000.2200	Verified By:	L. Meyer
Title:	STRUCTURAL MODIFICATION OF PROPOSED ANTENNA MOUNT AND EXISTING PENTHOUSE WALL	Date:	5/12/2020

BLACK & VEATCH

Wind Load

Wind Velocity Pressure @ z = 56 ft Q_z = 57.30 psf **(based on 145 mph wind)**

Gust factor: GCr = 1.90

Wind Load on Members:

Proposed Pipe Mast: Pipe 3.0 STD

Depth: Dp= 3.5 in.

Wind Load: Pp= Qz*GCr*Dp = **31.8 plf**

Wind Load (Continued)

Wind Load on Equipment:

(P) dbSpectra DS2C03F36D

Dimensions:	B=	0.25	ft.		
	H=	18.60	ft.		
Wind Load:	Pa=	Qz*GCr*B*H		=	**506.2 lbs.**
				=	**27.2 plf**

Note:

30° and 60° application of wind load will be considered directly in the load combinations by applying load factors of 0.866 (from cos 30 or sin 60) and 0.5 (from sin 30 or cos 60) 60mph service wind will also be considered directly in the load combinations by applying a reduction factor of **0.171** based on (60mph)^2 / (145mph)^2.

Owner:	EVERSOURCE	Computed By:	T. Eakkalak
Site Name:	NEW LONDON AWC	Date:	4/30/2020
Project No.	403093.2000.2200	Verified By:	L. Meyer
Title:	STRUCTURAL MODIFICATION OF PROPOSED ANTENNA MOUNT AND EXISTING PENTHOUSE WALL	Date:	5/12/2020

BLACK & VEATCH

ASCE 7-10 Section #

Ice Dead Load

Design Ice Thickness @ z = 33 ft T_i = **0.75 in.** — Fig. 10.2

Note: The design ice thickness shall be escalated with height when calculating the ice weight and wind force on the ice.

Platform and antennas height elevation, Z: 56.1 ft

Factored Ice Thickness, Tiz at Z for Ice Weight Calculations: — 10.4.6

$T_{iz} = 2.0 * T_i * I_i * f_z * (K_{zt})^{0.35}$ — T_{iz} = **1.98 in** — Eq. 10.4-5

where,

Importance Factor for Ice Thickness, I_i — 10.4.4

Structure Risk Category: III — Table 1.5-1

I_i = 1.25 (multiplier on ice thickness) — Table 1.5-2

Height Factor, f_z — 10.4.3

$f_z = (Z/33)^{0.10}$ = (56.1 / 33) ^0.10 = 1.05 — Eq. 10.4-4

Topographic Factor, K_{zt} — 10.4.5

$K_{zt} = [1 + K_1 K_2 K_3]^2$ = [1 + 0.00 x 0.00 x 0.00] ^2 = 1.000 — Eq. 26.8-1

K_1 = 0.00 μ = 0.00 γ = 0.00 — Fig. 26.8-1

			(Use same values from wind calcs)
Exposure Category =	C		
Hill Shape =	Flat Terrain		
Crest Type =	Upwind		
Hill Height, H =	15	ft	
Distance Upwind of crest, Lh =	15	ft	
Distance Upwind to Bldg Site, x =	15	ft	

$K_2 = (1 - x / \mu L_h)$ = [1 - 15 / (0.0 x 15)] = 0.00 — Fig. 26.8-1

$K_3 = e^{-(\gamma z / Lh)}$ = e^-(0.0 x 56 / 15) = 0.00 — Fig. 26.8-1

Ice Topographic Factor, $(K_{zt})^{0.35}$ = (1.000) ^0.35 = 1.000 — 10.4.5

The weight of ice shall be based on a unit weight of 56 pcf. (Per TIA-222-G 2.6.8) — 10.4.1

Therefore

W_{ice} = 56pcf * Tiz /12= **9.23 psf**

Ice Dead Load (Continued)

Design Ice Thickness @ z = 33 ft Ti = 0.75 in.

Factored ice thickness @ z = 51 ft Tiz = 1.98 in.

Ice Dead Load on Members:

Proposed Pipe Mast: Pipe 3.0 STD

Dimensions: Dia= 3.5 in. Dc= 3.50

Ice cross sectional area: Aiz= π Tiz (Dc + Tiz) = 34.02 in.^2

DLice= Aiz * 56pcf * ft2 / 144 in2 = **13.2** **plf**

Ice Dead Load (Continued)

Ice Dead Load on Equipment:

(P) dbSpectra DS2C03F36D

Dimensions w/out ice:	B=	3	in.	W=	3	in.
	H=	223.2	in.	Dc=	4.24	in.
Ice cross sectional area:	Aiz=	π Tiz (Dc + Tiz) =		38.63	in^2	
Ice Dead Load:	DLice=	[Aiz(H+2Tiz)+2Tiz B D]*56pcf /1728 in^3=				**285.6 lbs**
				=		**15.4 plf**

Owner:	EVERSOURCE	Computed By:	T. Eakkalak
Site Name:	NEW LONDON AWC	Date:	4/30/2020
Project No.	403093.2000.2200	Verified By:	L. Meyer
Title:	STRUCTURAL MODIFICATION OF PROPOSED ANTENNA MOUNT AND EXISTING PENTHOUSE WALL	Date:	5/12/2020

BLACK & VEATCH

Ice Wind Pressure per ASCE 7-10 / IBC 2012 / IBC 2015 / TIA-222-H

ASCE 7-10 Section #

a. Ultimate Velocity Pressure, $q_{z \text{ or } h}$ — 29.3.2

Basic Wind Speed, Vult = **50** mph — Fig. 10-2

$qz = 0.00256\ Kz\ Kzt\ Kd\ Ke\ Ks\ V^2$ — TIA-222-H

$= 0.00256 \times 1.12 \times 1.00 \times 0.95 \times 1.00 \times 1.00 \times 50.00^2$ — Sec. 2.6.11.6

$qz =$ 6.81 psf

b. Velocity pressure coefficient, Kz — 29.3.1

$Kz = 2.01\ (z/z_g)^{2/\alpha}$ — Exposure Category = **C**

$= 2.01\ (56 / 900^{(2/9.5)})$

$Kz =$ 1.12 — Height above Ground Level, z = 56 ft — Table 29.3-1

$\alpha =$ 9.50 — $z_g =$ 900.00 ft

c. Topographic Factor, Kzt — 26.8.2

H = 15 ft

$\mu =$ 0.00 — Fig. 26.8-1

$\gamma =$ 0.00 — Hill Shape: Flat Terrain

$K_1 =$ 0.00 — Crest Type: Upwind

$K_2 = (1 - x / \mu\ Lh)$ — Distance Upwind of crest, Lh = 15 ft

$= [1 - 15 / (0.0 \times 15)]$

$K_2 =$ 0.00 — Distance Upwind to Bldg Site, x = 15 ft

$K_3 = e^{(\gamma z / Lh)}$ — $Kzt = [\ 1 + K_1 K_2\ K_3\ ]^2$ — Eq. 26.8-1

$= e^{-(0.0 \times 56 / 15)}$ — $= [1 + 0.00 \times 0.00 \times 0.00]^2$

$K_3 =$ 0.00 — $Kzt =$ 1.00

d. Wind Directionality Factor, Kd — Table 26.6-1

(7) Chimney, Tank & Similar Structures - Round Shape — Kd = 0.95

e. Ground Elevation Factor, Ke — Ke = 1.00 — TIA-222-H Table 2-6

f. Rooftop Wind Speed-up Factor, Ks — Ks = 1.00 — TIA-222-H Sec. 2.6.7

g. Structure Risk Category — III — Table 1.5-1

h. Gust Effect Factor, G — G = 1.90 — **29.5.1**

Ice Wind Load

Wind Velocity Pressure @ z = 56 ft $Q_{z\ ice}$ = 6.81 psf **(based on 50 mph wind)**

Gust factor: GCr = 1.90

Ice Wind Load on Members:

Proposed Pipe Mast: Pipe 3.0 STD

Member Depth: Dp= 3.5 in. + 2 Tiz = 7 in.

Ice wind load: Pp= Qz ice*GCr*Dp = **8.0 plf**

Ice Wind Load (Continued)

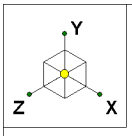
Ice Wind Load on Equipment:

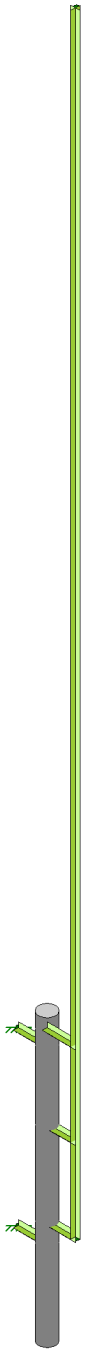
(P) dbSpectra DS2C03F36D

Dimensions:	B=	0.25 ft + (2 Tiz) / 12	=	0.58	ft.
	H=	18.60 ft + (2 Tiz) / 12	=	18.93	ft.
Wind Load:	Pa=	Qz ice*GCr*B*H =		**142.0**	**lbs.**
			=	**7.6**	**plf**

Note:

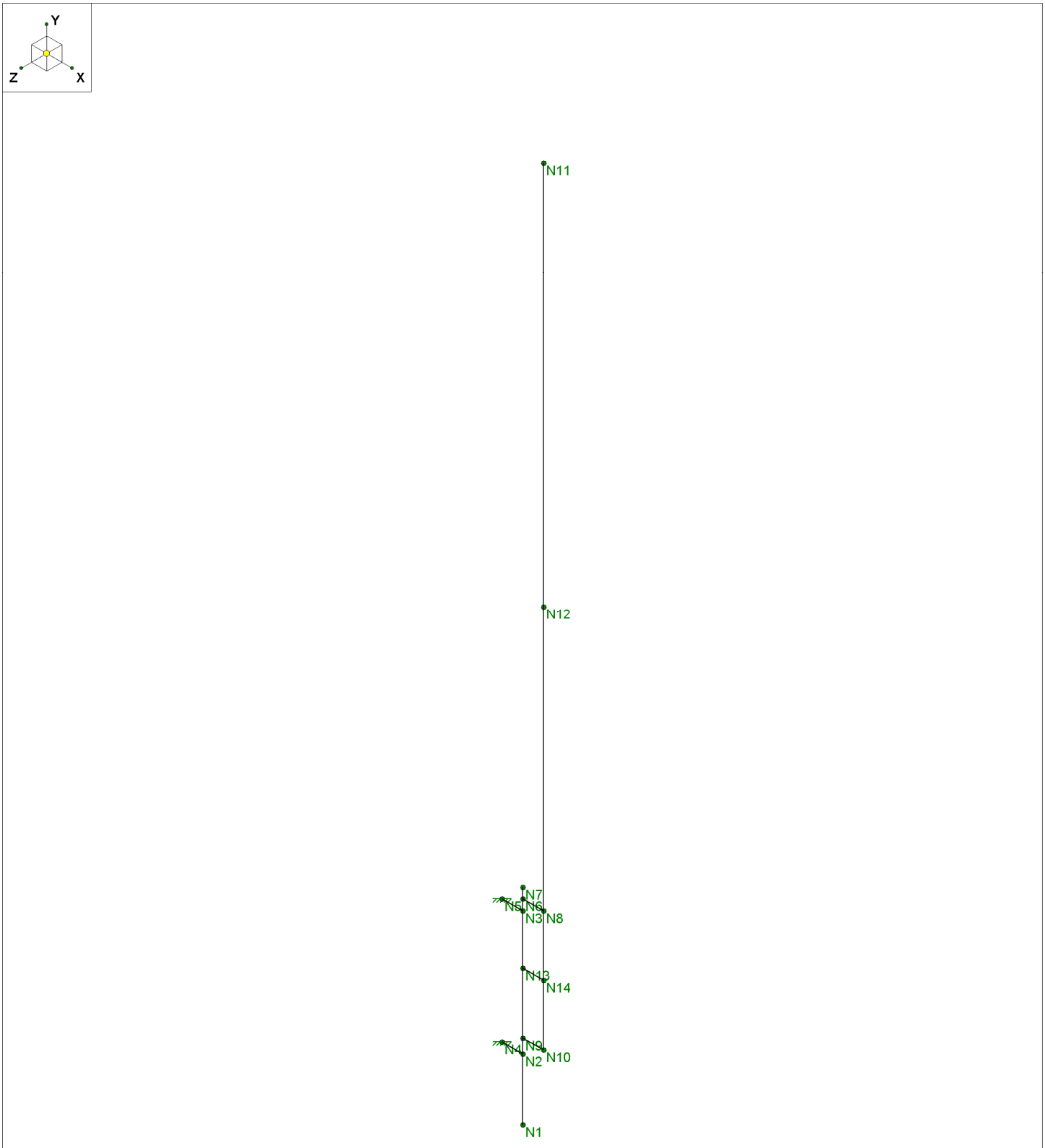
30° and 60° application of wind load will be considered directly in the load combinations by applying load factors of 0.866 (from cos 30 or sin 60) and 0.5 (from sin 30 or cos 60)





Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 1
T. Eakkalak		Apr 30, 2020 at 11:36 AM
403093.2000.2200		NewLondonAWC - Proposed Antenn...



Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 2
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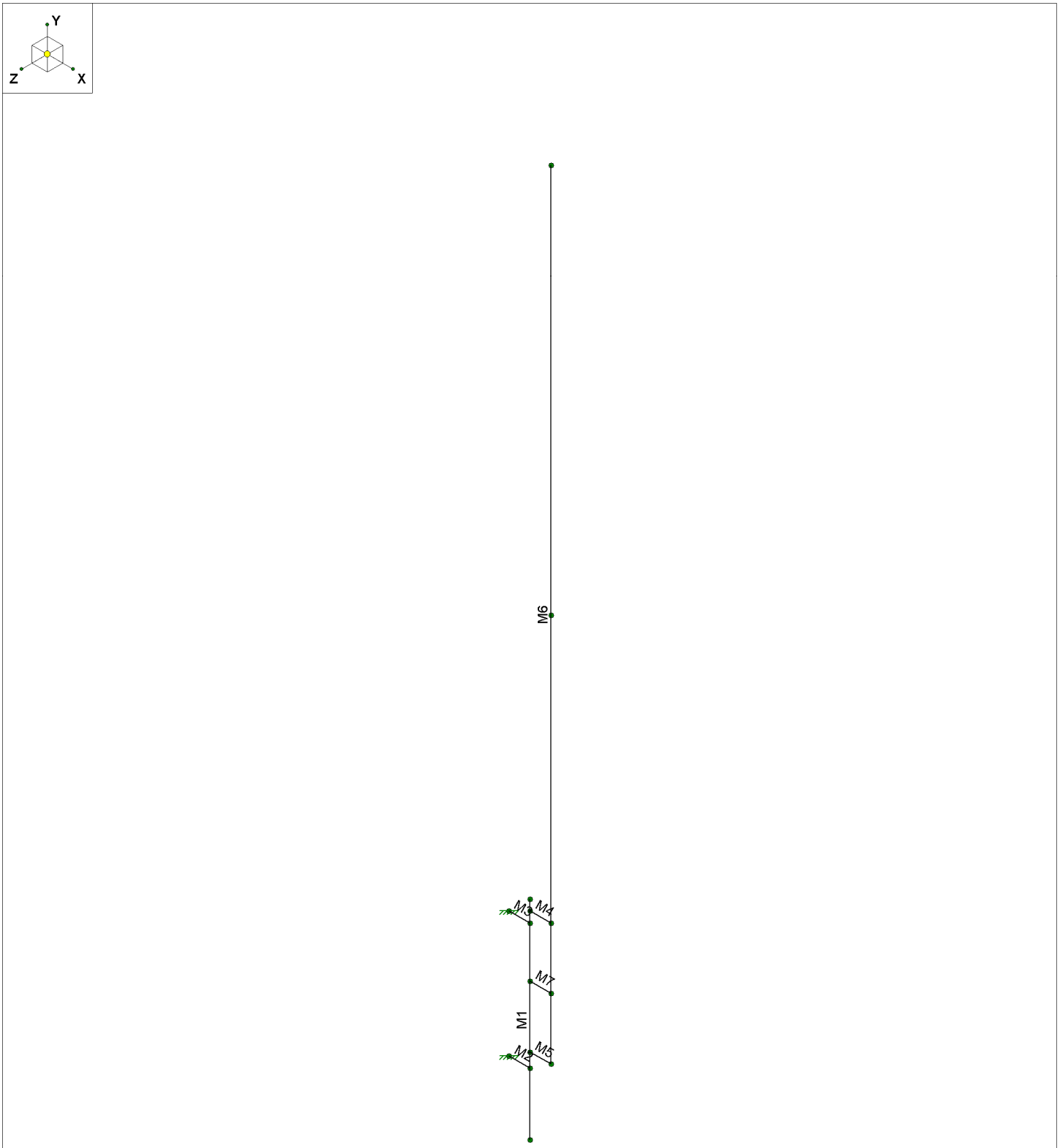
403093.2000.2200		NewLondonAWC - Proposed Antenn...



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Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 3
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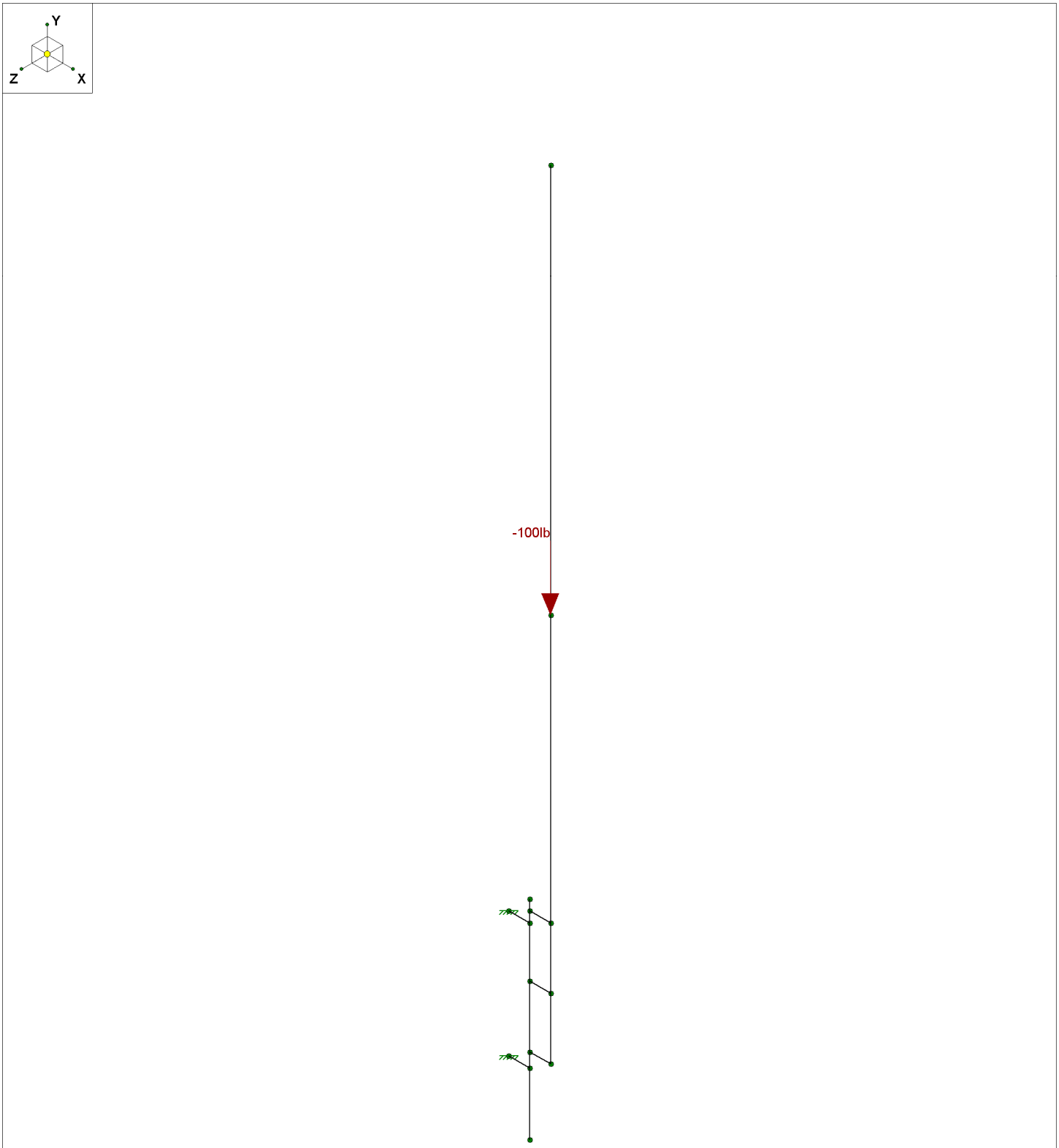
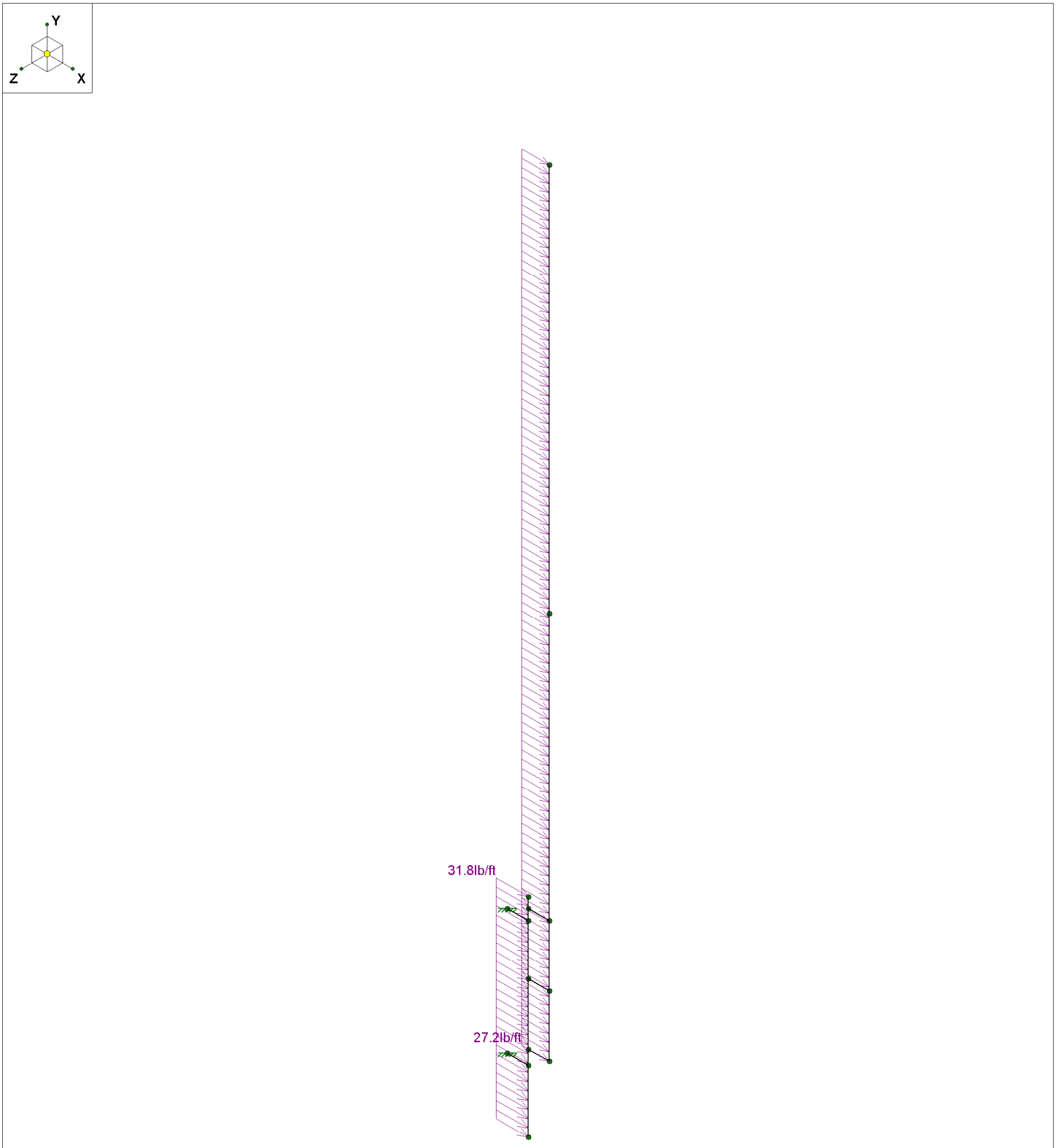
403093.2000.2200		NewLondonAWC - Proposed Antenn...



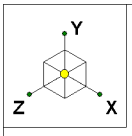
Loads: BLC 1, DL
Envelope Only Solution

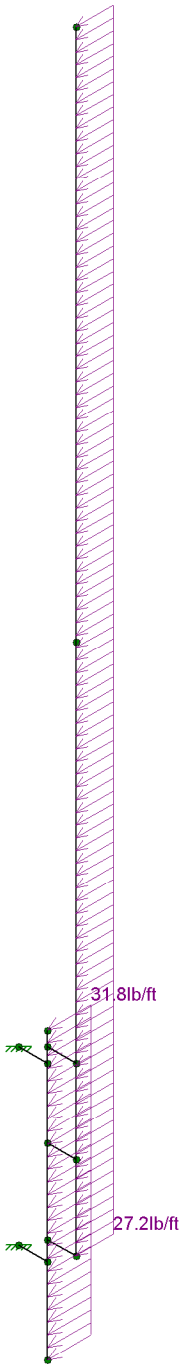
Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 4
T. Eakkalak		Apr 30, 2020 at 11:37 AM
403093.2000.2200		NewLondonAWC - Proposed Antenn...



Loads: BLC 3, Wind - 0 Deg (+X)
Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 5
T. Eakkalak		Apr 30, 2020 at 11:37 AM
403093.2000.2200		NewLondonAWC - Proposed Antenn...





Loads: BLC 4, Wind - 90 Deg (+Z)
Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 6
T. Eakkalak		Apr 30, 2020 at 11:37 AM
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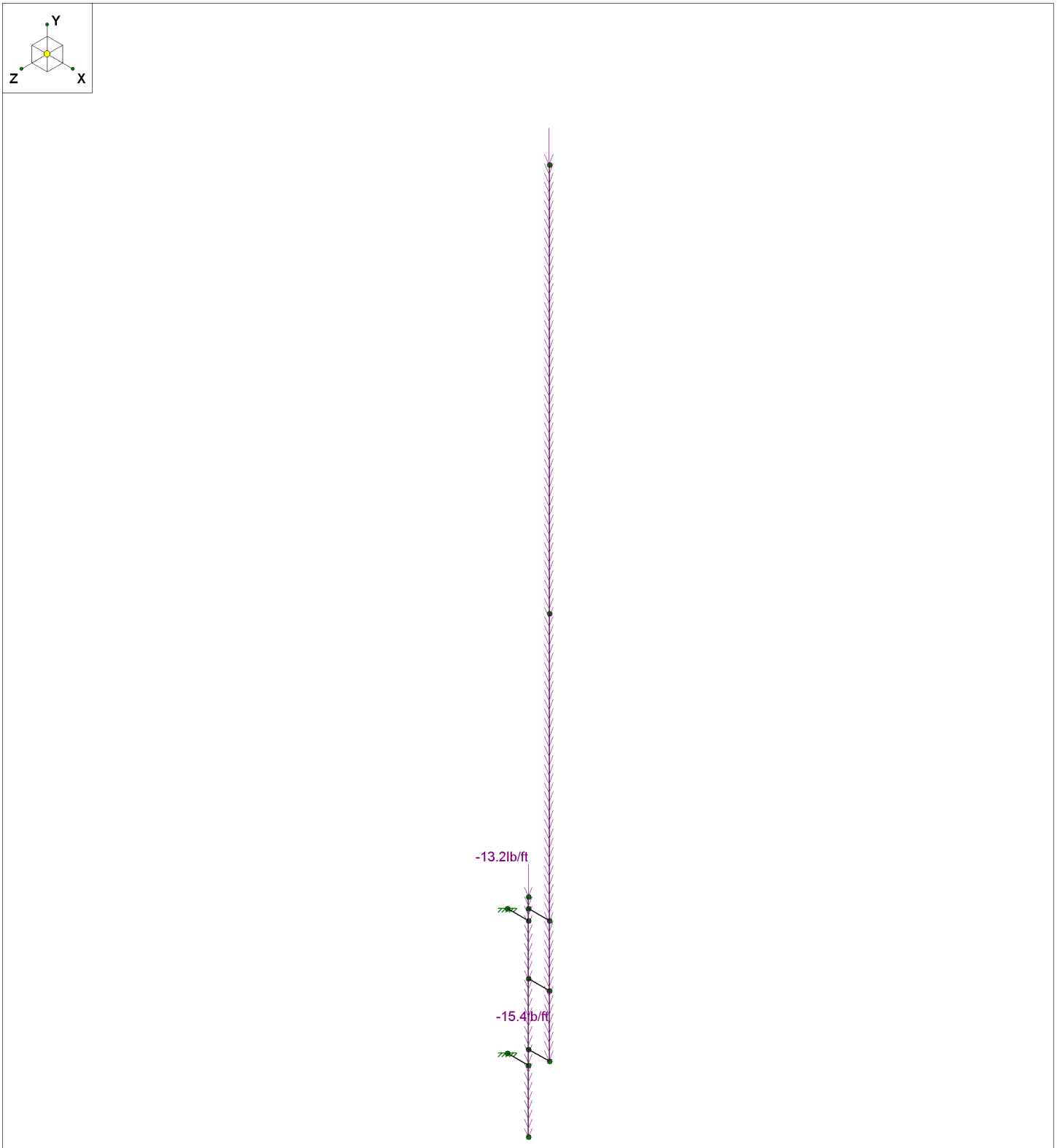

Loads: BLC 5, Ice DL
Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 7
T. Eakkalak		Apr 30, 2020 at 11:37 AM
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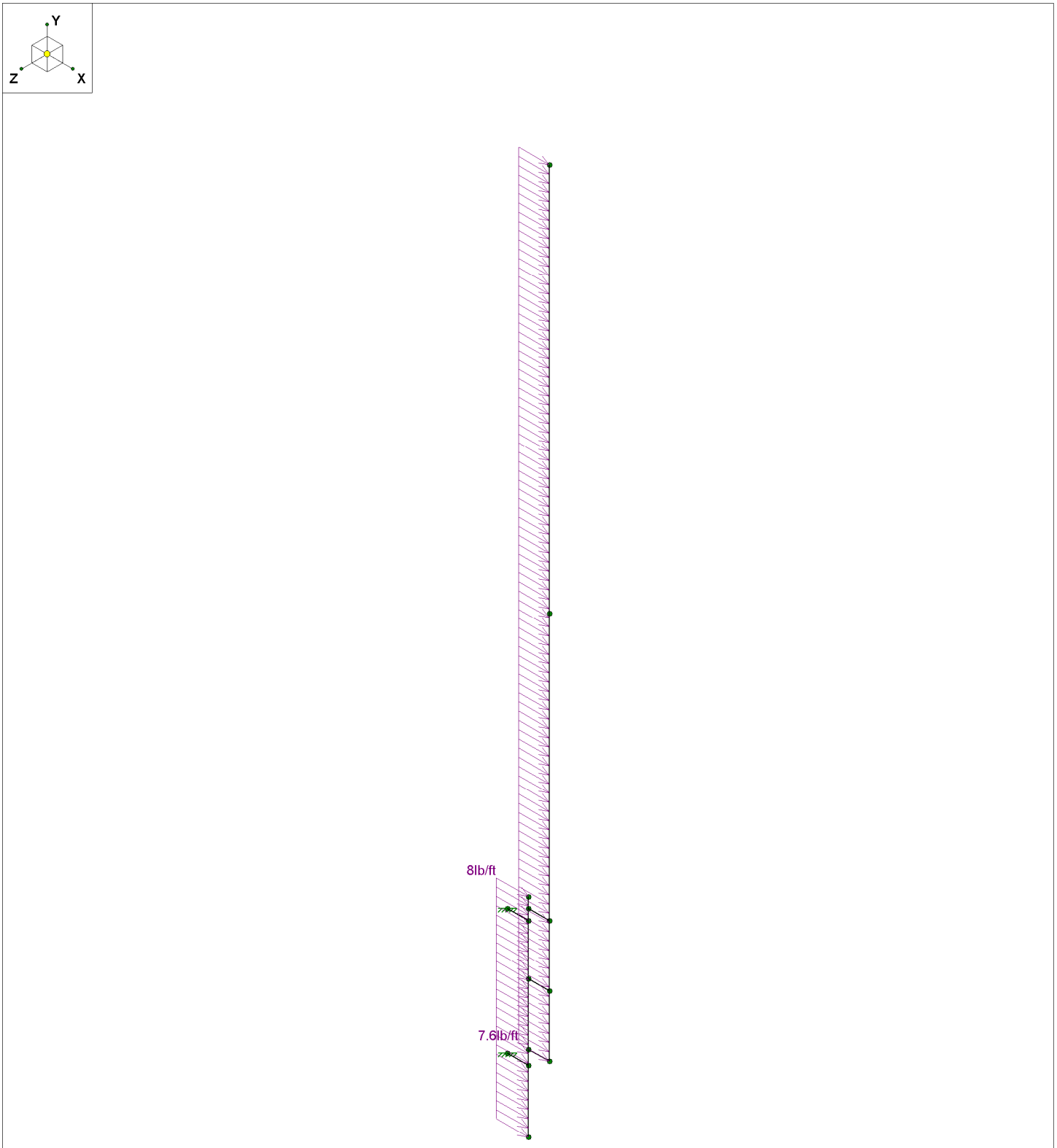
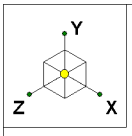
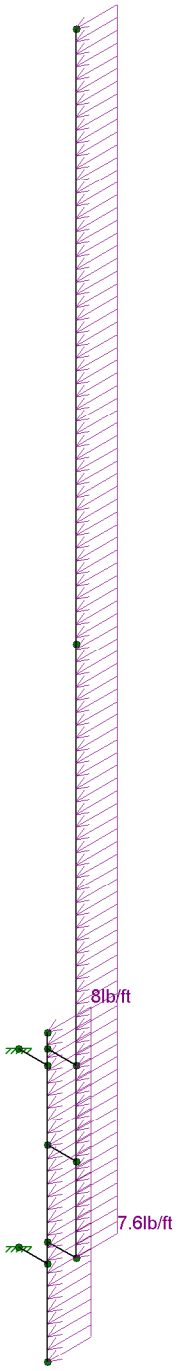


Loads: BLC 6, Ice Wind - 0 Deg (+X)

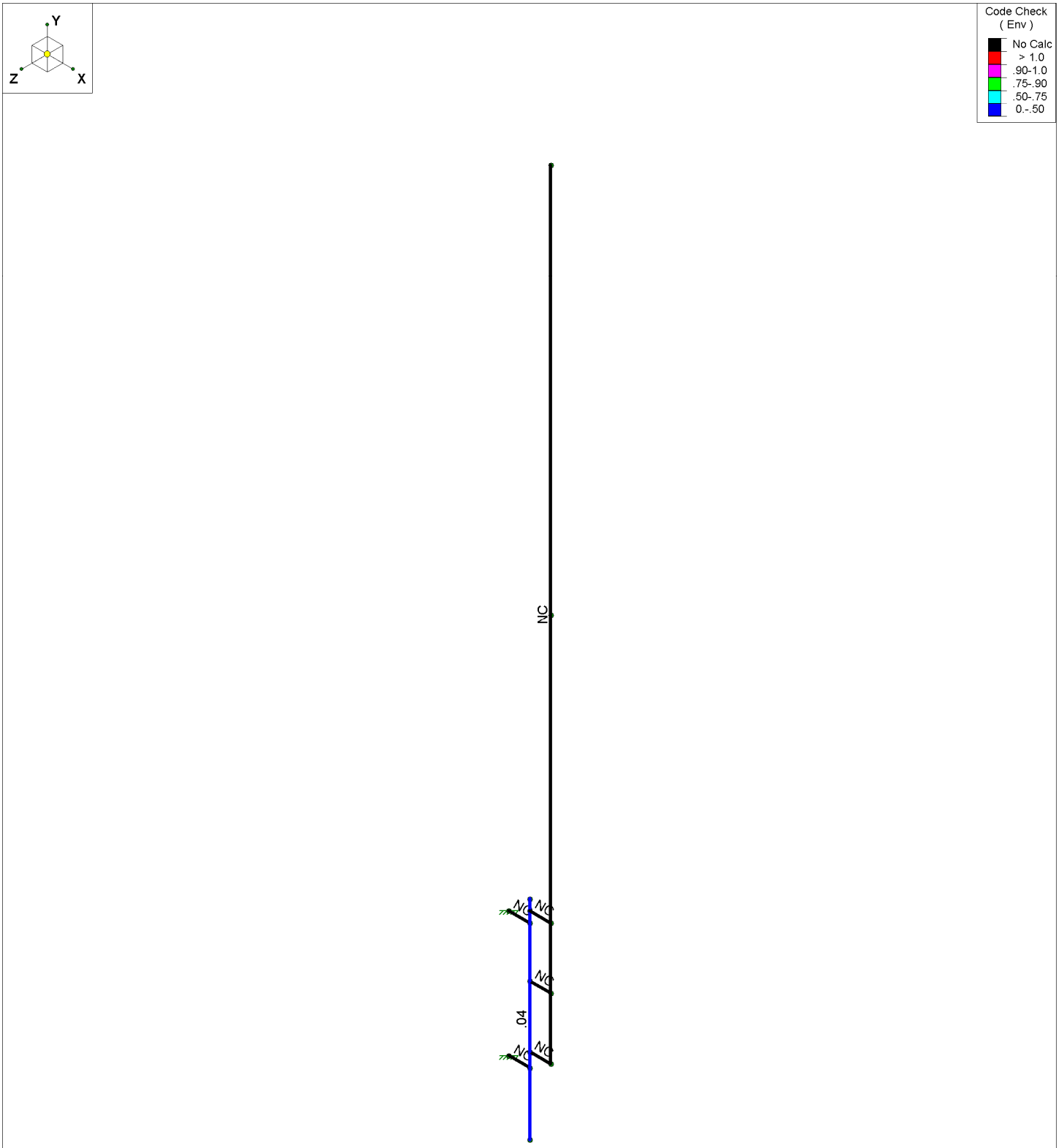
Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 8
T. Eakkalak		Apr 30, 2020 at 11:38 AM
403093.2000.2200		NewLondonAWC - Proposed Antenn...





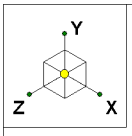
Loads: BLC 7, Ice Wind - 90 Deg (+Z)

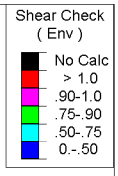
Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 9
T. Eakkalak		Apr 30, 2020 at 11:38 AM
403093.2000.2200		NewLondonAWC - Proposed Antenn...

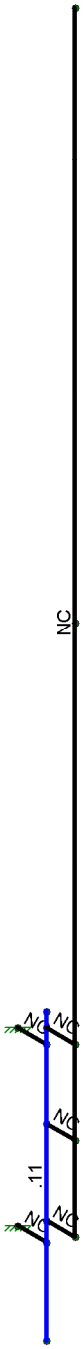


Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 10
T. Eakkalak		Apr 30, 2020 at 11:39 AM
403093.2000.2200		NewLondonAWC - Proposed Antenn...







Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Proposed Antenna Mount Analysis	SK - 11
T. Eakkalak		Apr 30, 2020 at 11:39 AM
403093.2000.2200		NewLondonAWC - Proposed Antenn...

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	None
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]
1	RIGID	1e+6		.3	0	0

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe 3.0 STD	PIPE_3.0	Column	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	RIGID		None	RIGID	1e+6	1e+6	1e+6	1e+6

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
1	N1	0	0	0	0	
2	N2	0	1.5	0	0	
3	N3	0	4.5	0	0	
4	N4	-.5	1.5	0	0	
5	N5	-.5	4.5	0	0	
6	N6	0	4.75	0	0	
7	N7	0	5	0	0	
8	N8	.5	4.75	0	0	
9	N9	0	1.83	0	0	
10	N10	.5	1.83	0	0	
11	N11	.5	20.43	0	0	
12	N12	.5	11.13	0	0	
13	N13	0	3.29	0	0	
14	N14	.5	3.29	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N4	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N5	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N7	N1			Pipe 3.0 STD	Column	Pipe	A53 Gr.B	Typical
2	M2	N4	N2			RIGID	None	None	RIGID	Typical
3	M3	N5	N3			RIGID	None	None	RIGID	Typical
4	M4	N6	N8			RIGID	None	None	RIGID	Typical
5	M5	N9	N10			RIGID	None	None	RIGID	Typical
6	M6	N10	N11			RIGID	None	None	RIGID	Typical
7	M7	N13	N14			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes	** NA **			None
2	M2						Yes	** NA **			None
3	M3						Yes	** NA **			None
4	M4						Yes	** NA **			None
5	M5						Yes	** NA **			None
6	M6						Yes	** NA **			None
7	M7						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top...	Lcomp bot...	L-torque[ft]	Kyy	Kzz	Cb	Functi...
1	M1	Pipe 3.0 STD	5									Lateral

Joint Loads and Enforced Displacements (BLC 1 : DL)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N12	L	Y	-100

Member Distributed Loads (BLC 3 : Wind - 0 Deg (+X))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	31.8	31.8	0	0
2	M6	PX	27.2	27.2	0	0

Member Distributed Loads (BLC 4 : Wind - 90 Deg (+Z))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	31.8	31.8	0	0
2	M6	PZ	27.2	27.2	0	0

Member Distributed Loads (BLC 5 : Ice DL)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-13.2	-13.2	0	0
2	M6	Y	-15.4	-15.4	0	0

Member Distributed Loads (BLC 6 : Ice Wind - 0 Deg (+X))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	8	8	0	0
2	M6	PX	7.6	7.6	0	0

Member Distributed Loads (BLC 7 : Ice Wind - 90 Deg (+Z))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]

Member Distributed Loads (BLC 7 : Ice Wind - 90 Deg (+Z)) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	8	8	0	0
2	M6	PZ	7.6	7.6	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	DL	DL		-1		1				
2	Roof LL	LL								
3	Wind - 0 Deg (+X)	WLX						2		
4	Wind - 90 Deg (+Z)	WLZ						2		
5	Ice DL	NL						2		
6	Ice Wind - 0 Deg (+X)	NLX						2		
7	Ice Wind - 90 Deg (+Z)	NLZ						2		

Load Combinations

	Description	Solve	PD...	S...	BLC	Factor	BLC	Factor	B...	Fact...	B...	Factor	B...	Factor	...	F.....	F.....	F.....	F.....	F...
1	LOAD COMBINATION USING STR...																			
2	WIND LOAD COMBINATIONS (Basi...																			
3	1.4DL	Yes	Y		DL	1.4														
4	1.2DL + 1.6LL	Yes	Y		DL	1.2	LL	1.6												
5	1.2DL + 1.6LL + 0.2IDL	Yes	Y		DL	1.2	LL	1.6	NL	.2										
6	1.2DL + 0.5WL (0 DEG)	Yes	Y		DL	1.2	WLX	.5	...											
7	1.2DL + 0.5WL (30 DEG)	Yes	Y		DL	1.2	WLX	.433	...	.25										
8	1.2DL + 0.5WL (60 DEG)	Yes	Y		DL	1.2	WLX	.25	...	.433										
9	1.2DL + 0.5WL (90 DEG)	Yes	Y		DL	1.2	WLX		...	.5										
10	1.2DL + 0.5WL (120 DEG)	Yes	Y		DL	1.2	WLX	-.25	...	.433										
11	1.2DL + 0.5WL (150 DEG)	Yes	Y		DL	1.2	WLX	-.433	...	.25										
12	1.2DL + 0.5WL (180 DEG)	Yes	Y		DL	1.2	WLX	-.5	...											
13	1.2DL + 0.5WL (210 DEG)	Yes	Y		DL	1.2	WLX	-.433	...	-.25										
14	1.2DL + 0.5WL (240 DEG)	Yes	Y		DL	1.2	WLX	-.25	...	-.433										
15	1.2DL + 0.5WL (270 DEG)	Yes	Y		DL	1.2	WLX		...	-.5										
16	1.2DL + 0.5WL (300 DEG)	Yes	Y		DL	1.2	WLX	.25	...	-.433										
17	1.2DL + 0.5WL (330 DEG)	Yes	Y		DL	1.2	WLX	.433	...	-.25										
18	1.2DL + 1.0LL + 1.0WL (0 DEG)	Yes	Y		DL	1.2	LL	1	...	1	...									
19	1.2DL + 1.0LL + 1.0WL (30 DEG)	Yes	Y		DL	1.2	LL	1	...	.866	...	.5								
20	1.2DL + 1.0LL + 1.0WL (60 DEG)	Yes	Y		DL	1.2	LL	1	...	.5	...	.866								
21	1.2DL + 1.0LL + 1.0WL (90 DEG)	Yes	Y		DL	1.2	LL	1	...		...	1								
22	1.2DL + 1.0LL + 1.0WL (120 DEG)	Yes	Y		DL	1.2	LL	1	...	-.5	...	.866								
23	1.2DL + 1.0LL + 1.0WL (150 DEG)	Yes	Y		DL	1.2	LL	1	...	-.866	...	.5								
24	1.2DL + 1.0LL + 1.0WL (180 DEG)	Yes	Y		DL	1.2	LL	1	...	-1	...									
25	1.2DL + 1.0LL + 1.0WL (210 DEG)	Yes	Y		DL	1.2	LL	1	...	-.866	...	-.5								
26	1.2DL + 1.0LL + 1.0WL (240 DEG)	Yes	Y		DL	1.2	LL	1	...	-.5	...	-.866								
27	1.2DL + 1.0LL + 1.0WL (270 DEG)	Yes	Y		DL	1.2	LL	1	...		...	-1								
28	1.2DL + 1.0LL + 1.0WL (300 DEG)	Yes	Y		DL	1.2	LL	1	...	.5	...	-.866								
29	1.2DL + 1.0LL + 1.0WL (330 DEG)	Yes	Y		DL	1.2	LL	1	...	.866	...	-.5								
30	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (0 ...	Yes	Y		DL	1.2	LL	1	NL	1	N...	1	N...							
31	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (3...	Yes	Y		DL	1.2	LL	1	NL	1	N...	.866	N...	.5						
32	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (6...	Yes	Y		DL	1.2	LL	1	NL	1	N...	.5	N...	.866						
33	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (9...	Yes	Y		DL	1.2	LL	1	NL	1	N...		N...	1						
34	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (1...	Yes	Y		DL	1.2	LL	1	NL	1	N...	-.5	N...	.866						
35	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (1...	Yes	Y		DL	1.2	LL	1	NL	1	N...	-.866	N...	.5						
36	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (1...	Yes	Y		DL	1.2	LL	1	NL	1	N...	-1	N...							
37	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (2...	Yes	Y		DL	1.2	LL	1	NL	1	N...	-.866	N...	-.5						
38	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (2...	Yes	Y		DL	1.2	LL	1	NL	1	N...	-.5	N...	-.866						
39	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (2...	Yes	Y		DL	1.2	LL	1	NL	1	N...		N...	-1						

Load Combinations (Continued)

	Description	Solve	PD...	S...	BLC	Factor	BLC	Factor	B...	Fact...	B...	Factor	B...	Factor	...	F.....	F.....	F.....	F.....	F.....	F...
40	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (3...	Yes	Y		DL	1.2	LL	1	NL	1	N...	.5	N...	-.866							
41	1.2DL + 1.0LL + 1.0IDL + 1.0IWL (3...	Yes	Y		DL	1.2	LL	1	NL	1	N...	.866	N...	-.5							
42	0.9DL + 1.0WL (0 DEG)	Yes	Y		DL	.9	WLX	1	...												
43	0.9DL + 1.0WL (30 DEG)	Yes	Y		DL	.9	WLX	.866	...	.5											
44	0.9DL + 1.0WL (60 DEG)	Yes	Y		DL	.9	WLX	.5	...	.866											
45	0.9DL + 1.0WL (90 DEG)	Yes	Y		DL	.9	WLX		...	1											
46	0.9DL + 1.0WL (120 DEG)	Yes	Y		DL	.9	WLX	-.5	...	.866											
47	0.9DL + 1.0WL (150 DEG)	Yes	Y		DL	.9	WLX	-.866	...	.5											
48	0.9DL + 1.0WL (180 DEG)	Yes	Y		DL	.9	WLX	-1	...												
49	0.9DL + 1.0WL (210 DEG)	Yes	Y		DL	.9	WLX	-.866	...	-.5											
50	0.9DL + 1.0WL (240 DEG)	Yes	Y		DL	.9	WLX	-.5	...	-.866											
51	0.9DL + 1.0WL (270 DEG)	Yes	Y		DL	.9	WLX		...	-1											
52	0.9DL + 1.0WL (300 DEG)	Yes	Y		DL	.9	WLX	.5	...	-.866											
53	0.9DL + 1.0WL (330 DEG)	Yes	Y		DL	.9	WLX	.866	...	-.5											
54	0.9DL + 1.0IDL + 1.0IWL (0 DEG)	Yes	Y		DL	.9	NL	1	N...	1	N...										
55	0.9DL + 1.0IDL + 1.0IWL (30 DEG)	Yes	Y		DL	.9	NL	1	N...	.866	N...	.5									
56	0.9DL + 1.0IDL + 1.0IWL (60 DEG)	Yes	Y		DL	.9	NL	1	N...	.5	N...	.866									
57	0.9DL + 1.0IDL + 1.0IWL (90 DEG)	Yes	Y		DL	.9	NL	1	N...		N...	1									
58	0.9DL + 1.0IDL + 1.0IWL (120 DEG)	Yes	Y		DL	.9	NL	1	N...	-.5	N...	.866									
59	0.9DL + 1.0IDL + 1.0IWL (150 DEG)	Yes	Y		DL	.9	NL	1	N...	-.866	N...	.5									
60	0.9DL + 1.0IDL + 1.0IWL (180 DEG)	Yes	Y		DL	.9	NL	1	N...	-1	N...										
61	0.9DL + 1.0IDL + 1.0IWL (210 DEG)	Yes	Y		DL	.9	NL	1	N...	-.866	N...	-.5									
62	0.9DL + 1.0IDL + 1.0IWL (240 DEG)	Yes	Y		DL	.9	NL	1	N...	-.5	N...	-.866									
63	0.9DL + 1.0IDL + 1.0IWL (270 DEG)	Yes	Y		DL	.9	NL	1	N...		N...	-1									
64	0.9DL + 1.0IDL + 1.0IWL (300 DEG)	Yes	Y		DL	.9	NL	1	N...	.5	N...	-.866									
65	0.9DL + 1.0IDL + 1.0IWL (330 DEG)	Yes	Y		DL	.9	NL	1	N...	.866	N...	-.5									
66																					

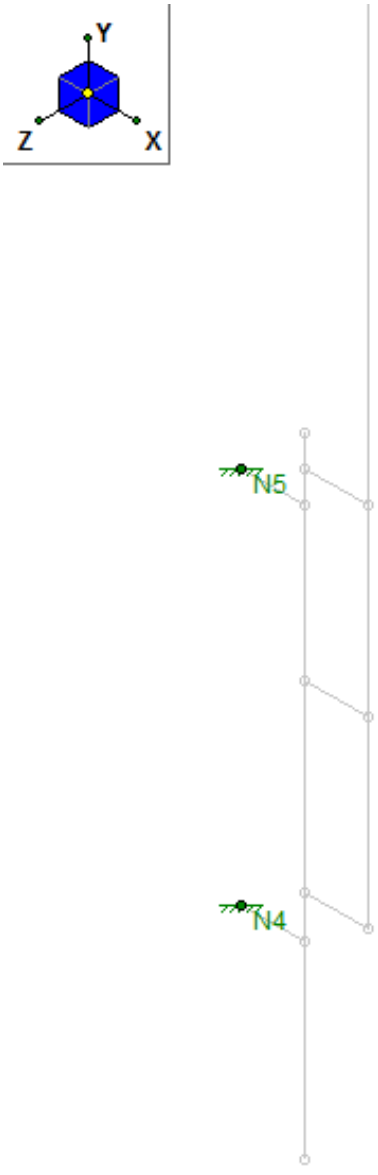
Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Ch...	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt [...	phi*Mn y-...	phi*Mn z...	Cb	Eqn
1	M1	PIPE_3.0	.036	3.177	18	.107	.469		27	57037.4...	65205	5748.75	5748.75	3.93	H1-1b

ENV. REACTION FOR PROPOSED ANTENNA MOUNT

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N4	max	1016.462	18	214.577	30	996.549	21	174.916	21	400.71	27	206.563	24
2		min	-981.613	48	51.606	48	-996.549	27	-174.916	27	-400.71	21	-151.153	42
3	N5	max	1646.533	48	300.143	36	1661.469	27	221.542	27	986.13	21	271.25	18
4		min	-1681.382	18	70.029	42	-1661.469	21	-221.542	21	-986.13	27	-184.233	48
5	Totals:	max	664.92	48	514.703	36	664.92	51						
6		min	-664.92	18	121.697	42	-664.92	21						



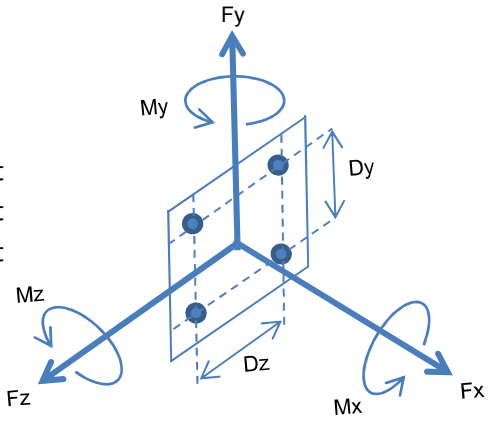
Owner:	EVERSOURCE	Prepared By:	T. Eakkalak
Plant:	NEW LONDON AWC	Date:	5/28/2020
Project No.	403093.2000.2200	Verified By:	L. Meyer
Title:	STRUCTURAL MODIFICATION OF PROPOSED ANTENNA MOUNT AND EXISTING PENTHOUSE WALL	Date:	5/12/2020

BLACK & VEATCH

Wall Anchor Check (LRFD) - Bolted Thru Wall

AISC 14th Ed.

Load Inputs:		Envelope	
Vertical Force	Fy =	300	lbs
Horizontal Force (Tension)	Fx =	1,682	lbs
Horizontal Force	Fz =	1,662	lbs
Moment about Y-Axis	My =	986	lbs-ft
Moment about X-Axis	Mx =	222	lbs-ft
Moment about Z-Axis	Mz =	271	lbs-ft
Force Couple Y-Axis	Dy =	10	in
Force Couple Z-Axis	Dz =	10	in
Number of Anchors	N =	4	



Shear from Fy	Sy =	75	lbs	Sy = Fy / N
Tension from Fx	Tx =	421	lbs	Tx = Fx / N
Shear from Fz	Sz =	416	lbs	Sz = Fz / N
Tension from My	Tmy =	592	lbs	Tmy = My / Dz / (N/2)
Shear from Mx	Smx =	133	lbs	Smx = Mx / Dz / (N/2)
Tension from Mz	Tmz =	163	lbs	Tmz = Mz / Dy / (N/2)
Total Shear	S =	443	lbs	$S = SQRT(Sx^2 + Sz^2 + Smy^2)$
Total Tension	T =	1175	lbs	T = Ty + Tmx + Tmz

Owner:	EVERSOURCE			Prepared By:	T. Eakkalak
Plant:	NEW LONDON AWC			Date:	5/28/2020
Project No.	403093.2000.2200	File No.		Verified By:	L. Meyer
Title:	STRUCTURAL MODIFICATION OF PROPOSED ANTENNA MOUNT AND EXISTING PENTHOUSE WALL			Date:	5/12/2020

BLACK & VEATCH

Wall Anchor Check (LRFD) - Bolted Thru Wall (Continued)

Thru Bolt Steel Analysis

					AISC 14th Ed. Section #
Loads					
Applied Shear Load	V_{ua} =	443	lbs	per bolt	
Applied Tensile Load	N_{ua} =	1,175	lbs	per bolt	
Parameters					
Bolt Diameter	d_b =	1/2	in		
Bolt Gross Area	A_b =	0.196	in^2	$\pi d_b^2 / 4$	
Specified Yield Strength of Bolt	f_y =	57	ksi		
Specified Tensile Strength of Bolt	f_{uta} =	74	ksi	SAE J429 Grade 2	
Results					
Strength Resistance Factor	φ =	0.75			J3.2
Nominal Shear Strength	F_{nv} =	33.3	ksi	$0.45 \times f_{uta}$ (ductile)	C-J3-4
Nominal Tensile Strength	F_{nt} =	55.5	ksi	$0.75 \times F_{ut}$ (ductile)	C-J3-2
Design Shear Strength of Bolt	φR_{nv} =	4,904	lbs	$\varphi \times F_{nv} \times A_b$	Eq. J3-1
Design Tensile Strength of Bolt	φR_{nt} =	8,173	lbs	$\varphi \times F_{nt} \times A_b$	Eq. J3-1
Required Shear Stress for Bolt	f_v =	2.3	ksi	V_{ua} / A_b	
Required Tensile Stress for Bolt	f_t =	6.0	ksi	N_{ua} / A_b	
Combined Shear and Tension					
$F'_{nt} = 1.3 F_{nt} - F_{nt} f_v / F_{nv} / \phi \leq F_{nt}$	F'_{nt} =	67.1	ksi > Fnt	Use Fnt for Eq. J3-2	Eq. J3-3a
Available Tensile Strength of Bolt	φR_{nt} =	8,173	lbs	$\varphi \times$ Fnt $\times$ Ab	Eq. J3-2
Stress Ratio (Less than 1.0)	SR =	0.144		$N_{ua} / \varphi R_{nt}$ OK	
Available Shear Strength of Bolt	φR_{nv} =	4,904	lbs	$\varphi \times F_{nv} \times A_b$	J3.7
Stress Ratio (Less than 1.0)	SR =	0.090		$V_{ua} / \varphi R_{nv}$ OK	

Use 1/2"ϕ SAE J429 Grade 2 bolts thru existing penthouse wall

REVISED, SUPERSEDED AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED AND DATED BY THE RESPONSIBLE INDIVIDUAL.

5.2 Structural Modification of Existing Penthouse Wall

- WIND LOADS ON BUILDINGS - MWFRS (DIRECTIONAL PROCEDURE)

Basic Wind Speed, V	=	**145**	mph
Exposure Category	=	**C**	
Velocity Pressure Exposure Coefficient, Kz = 2.01 $(z/z_g)^{2/\alpha}$	=	1.03	
Topographic Factor, Kzt	=	**1.00**	
Wind Directionality Factor, Kd	=	**0.85**	
qz = qh = 0.00256 Kz Kzt Kd V^2	=	46.97	psf
Gust Effect Factor, G	=	**0.85**	
Angle of Roof	=	**0**	degree
Height above ground, z	=	**37.0**	ft
Width of Building, B	=	**80.0**	ft
Length of Building, L	=	**234.0**	ft

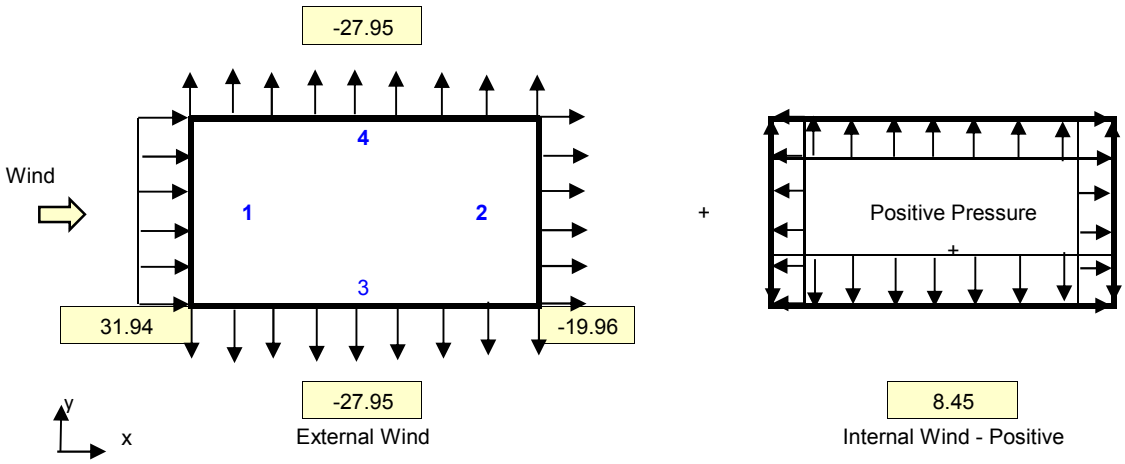
- ENCLOSED AND PARTIALLY ENCLOSED RIGID BUILDING

L/B	=	2.93	
External Pressure Coefficient, Cp (Windward Wall)	=	**0.80**	All values
External Pressure Coefficient, Cp (Leeward Wall)	=	**-0.50**	L/B
External Pressure Coefficient, Cp (Side Wall)	=	**-0.70**	All values
Internal Pressure Coefficient, GCpi	=	**0.18**	Internal Possitive
	=	**-0.18**	Internal Negative

Case I) Wind Apply to Risa

p = q*G*Cp - qi*(GCpi)

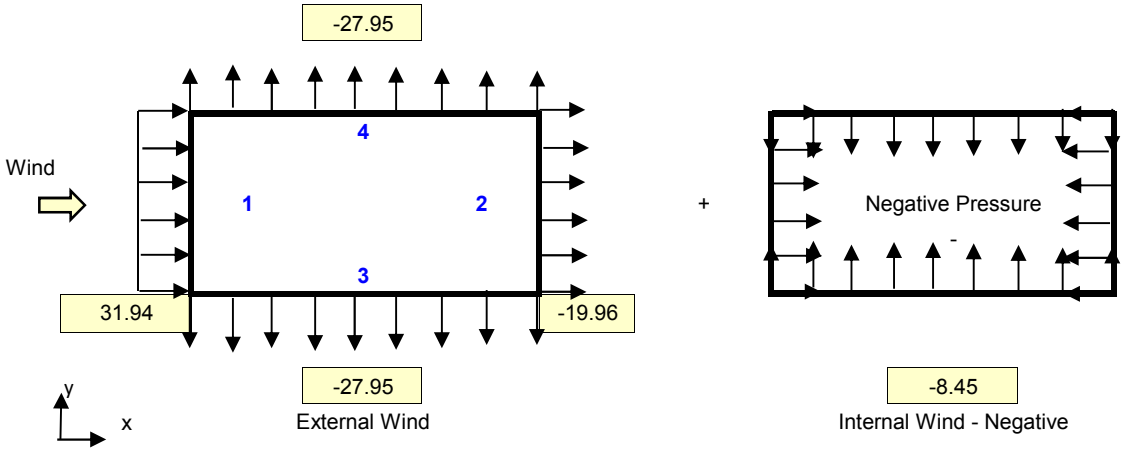
p1 = 46.97*0.85*0.8 - 46.97*0.18	=	**23.49**	psf
p2 = 46.97*0.85*-0.5 - 46.97*0.18	=	**-28.42**	psf
p3,4 = 46.97*0.85*-0.7 - 46.97*0.18	=	**-36.40**	psf



Case II) Wind Apply to Risa

p = q*G*Cp - qi*(GCpi)

p1 = 46.97*0.85*0.8 - 46.97*-0.18	=	**40.39**	psf
p2 = 46.97*0.85*-0.5 - 46.97*0.18	=	**-11.51**	psf
p3,4 = 46.97*0.85*-0.7 - 46.97*0.18	=	**-19.49**	psf



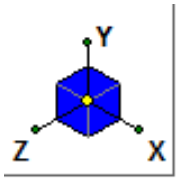
- Wind Load Acting Frame

Spacing of Wood Frame	=	16	in
Max. Wind Pressure Load, p1w	=	**40.39**	psf
Max. Wind Pressure Load, p2w	=	**-28.42**	psf
Max. Wind Pressure Load, p3w, p4w	=	**-36.40**	psf
Wind Load Acting Wood Frame, Pw (Wind 0 Deg +X)	=	**-37.89**	lbs/ft
Wind Load Acting Wood Frame, Pw (Wind 180 Deg -X)	=	**53.86**	lbs/ft
Wind Load Acting Wood Frame, Pw (Wind 90 Deg +Z)	=	**-48.54**	lbs/ft
Wind Load Acting Wood Frame, Pw (Wind 270 Deg -Z)	=	**-48.54**	lbs/ft

REACTION WIND UN-FACTOR FOR CHECK EXISTING PENTHOUSE WALL

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N4	max	1012.078	4	365.067	4	1012.083	7	0	27	408.477	13	0	27
2		min	-1012.088	10	-365.076	10	-1012.083	13	0	1	-408.477	7	0	1
3	N5	max	1677.008	10	365.076	10	1677.003	13	0	27	993.897	7	0	27
4		min	-1676.998	4	-365.067	4	-1677.003	7	0	1	-993.897	13	0	1
5	Totals:	max	664.92	10	352.44	3	664.92	13						
6		min	-664.92	4	0	4	-664.92	7						



DL REACTION

NODE N5

Fx = 39 lbs
Fy = - 85 lbs

NODE N4

Fx = - 39 lbs
Fy = - 51 lbs

WIND X REACTION

NODE N5

Fx = 1677 lbs
Fy = - 365 lbs
Fz = 0 lbs

My = 0 lbs-ft

NODE N4

Fx = 1012 lbs
Fy = 365 lbs
Fz = 0 lbs

My = 0 lbs-ft

WIND Z REACTION

NODE N5

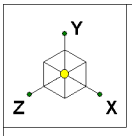
Fx = 0 lbs
Fy = 0 lbs
Fz = 1677 lbs

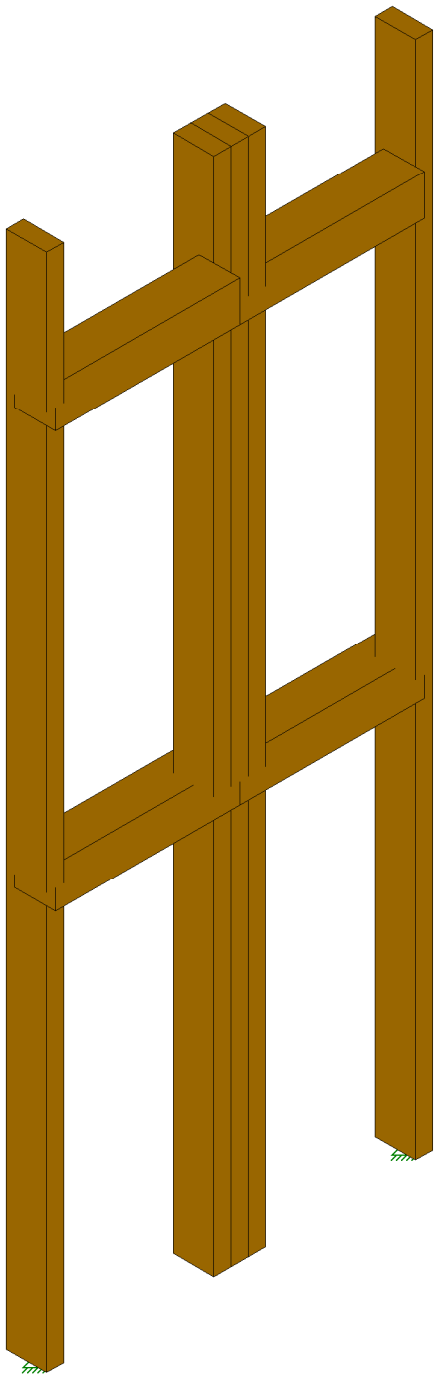
My = - 994 lbs-ft

NODE N4

Fx = 0 lbs
Fy = 0 lbs
Fz = 1012 lbs

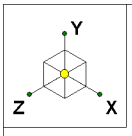
My = 408 lbs-ft

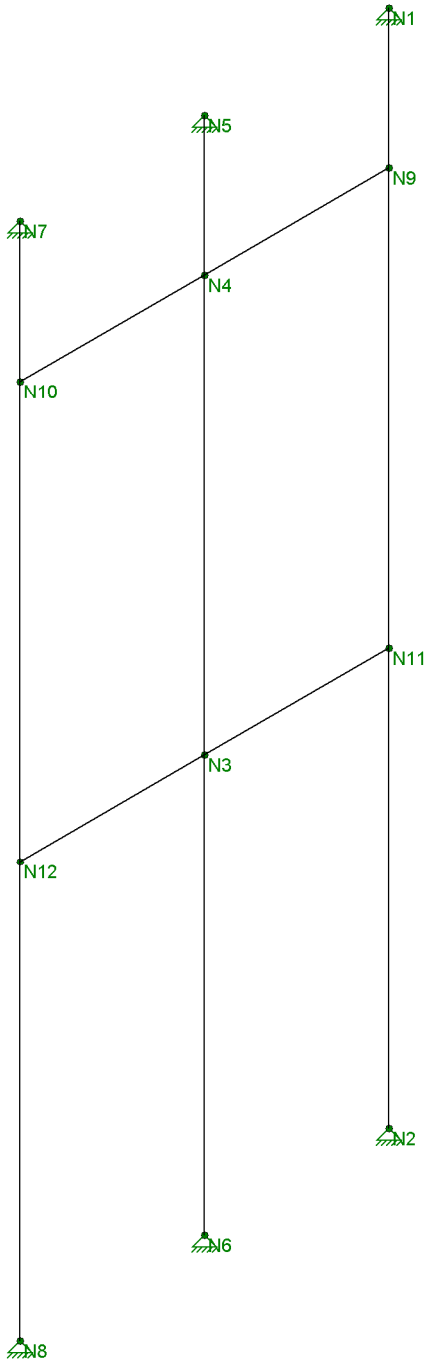




Envelope Only Solution

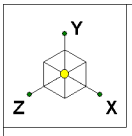
Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 1
T. Eakkalak		May 28, 2020 at 1:04 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...

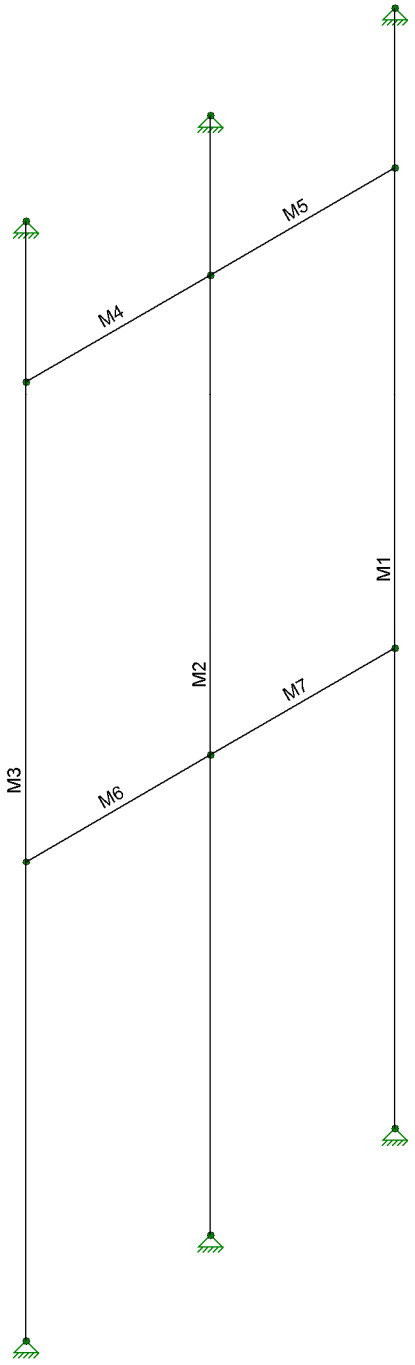




Envelope Only Solution

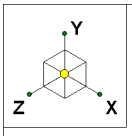
Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 2
T. Eakkalak		May 28, 2020 at 1:04 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...

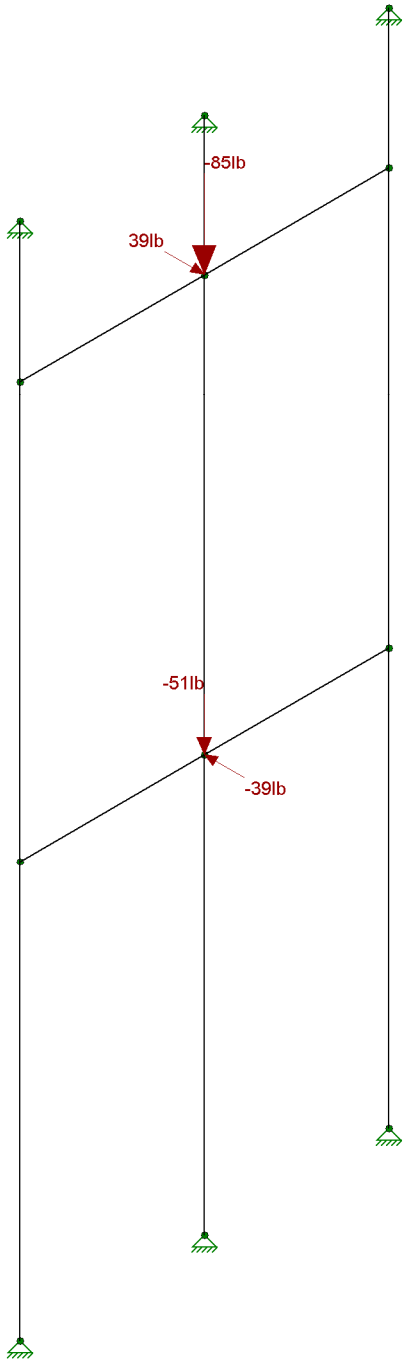




Envelope Only Solution

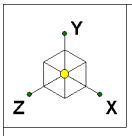
Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 3
T. Eakkalak		May 28, 2020 at 1:04 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...

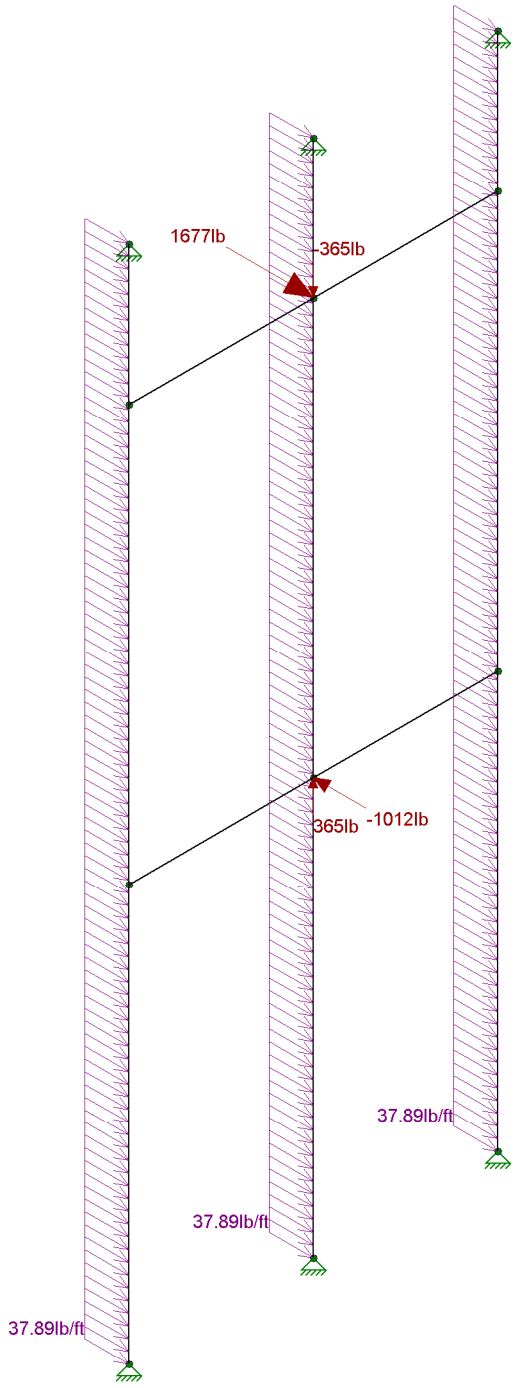




Loads: BLC 1, DL
Envelope Only Solution

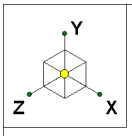
Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 4
T. Eakkalak		May 28, 2020 at 1:05 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...

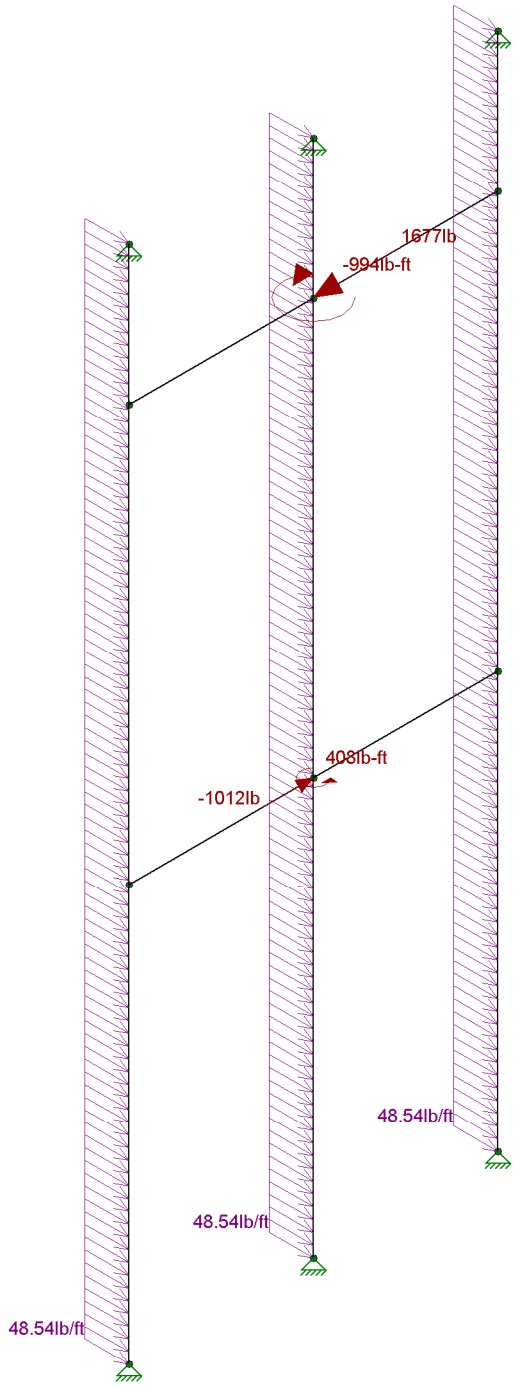




Loads: BLC 3, Wind - 0 Deg (+X)
Envelope Only Solution

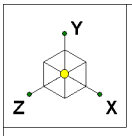
Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 5
T. Eakkalak		May 28, 2020 at 1:05 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...

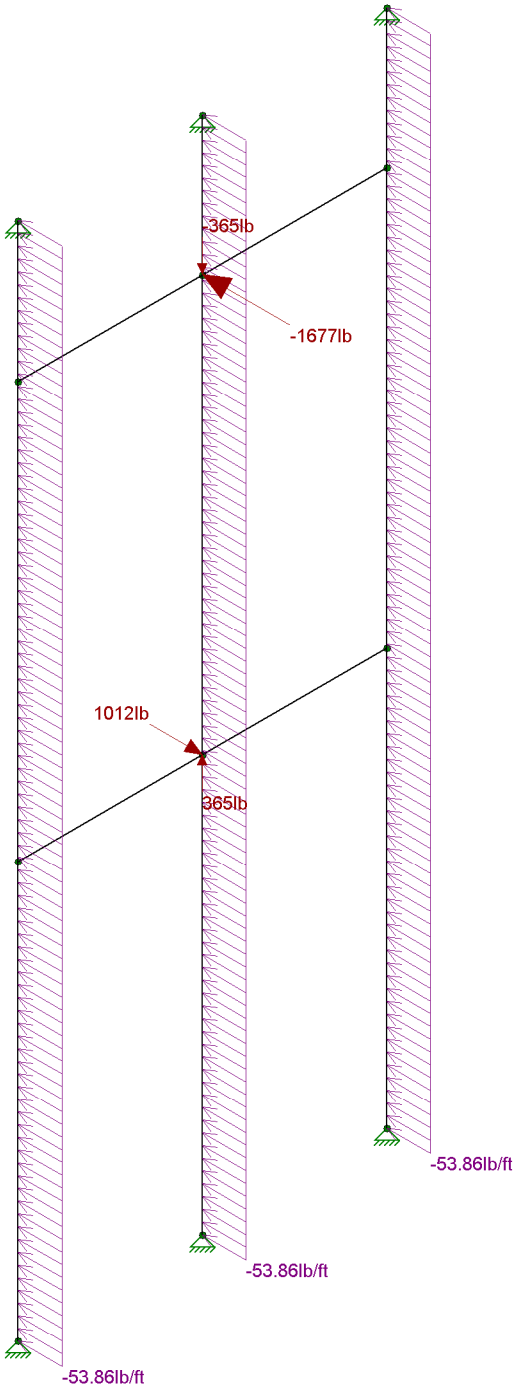




Loads: BLC 4, Wind - 90 Deg (+Z)
Envelope Only Solution

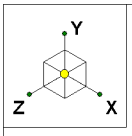
Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 6
T. Eakkalak		May 28, 2020 at 1:05 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...

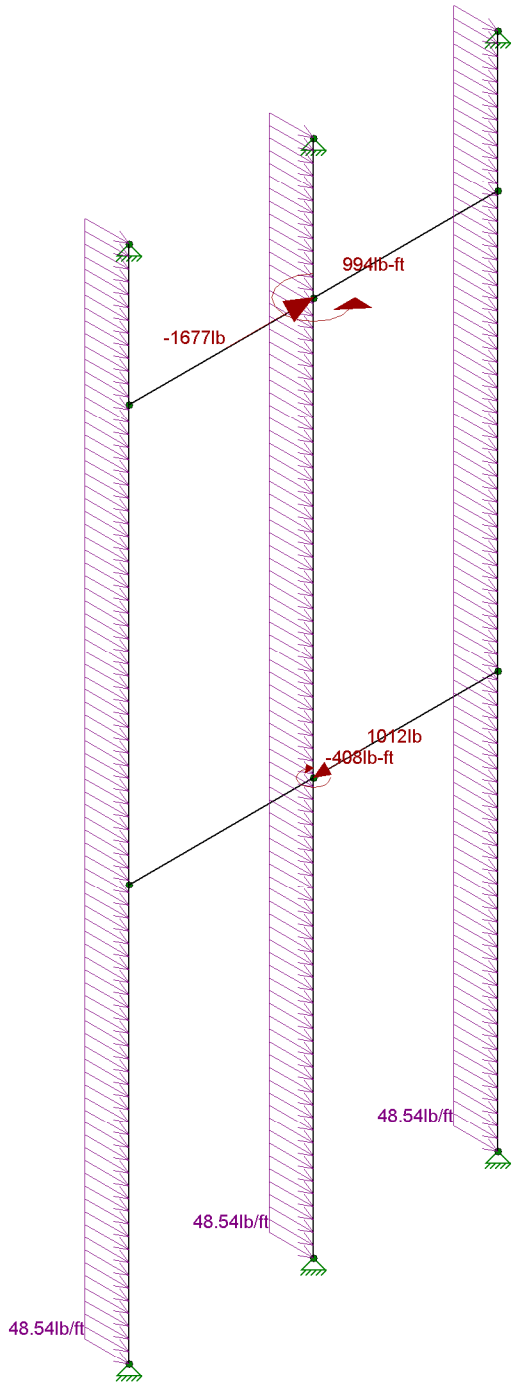




Loads: BLC 5, Wind - 180 Deg (-X)
Envelope Only Solution

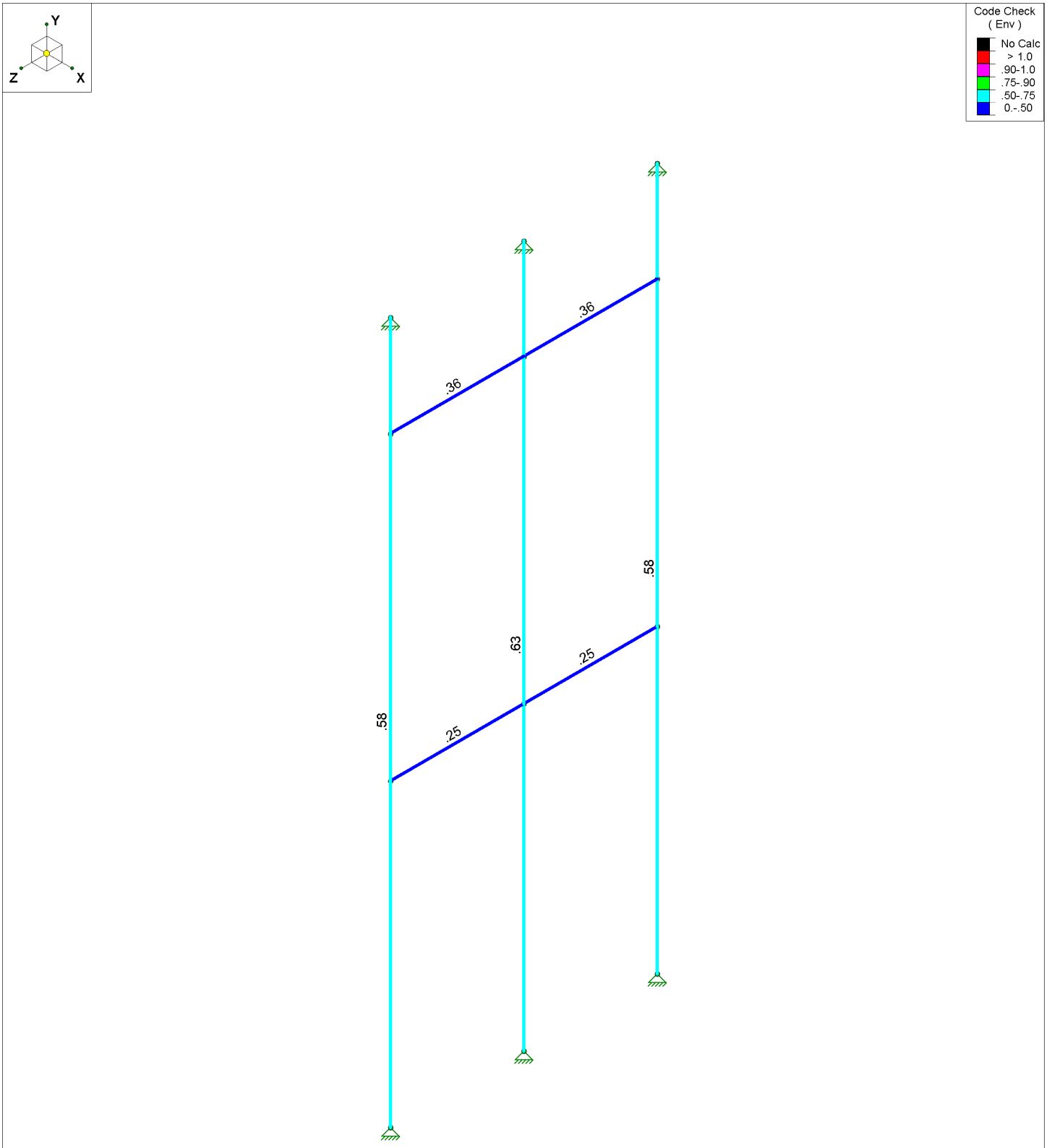
Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 7
T. Eakkalak		May 28, 2020 at 1:05 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...





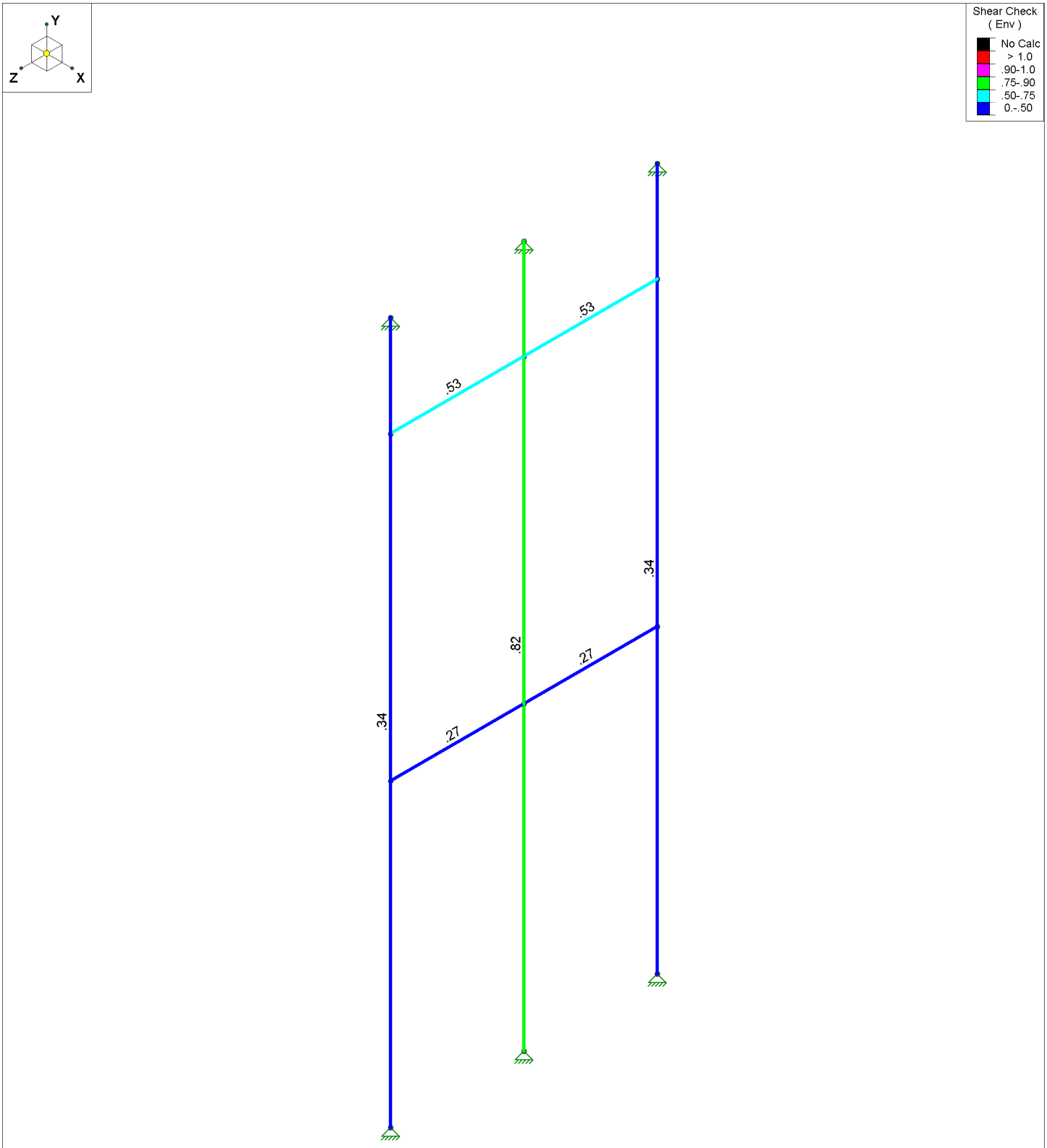
Loads: BLC 6, Wind - 270 Deg (-Z)
Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 8
T. Eakkalak		May 28, 2020 at 1:05 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 9
T. Eakkalak		May 28, 2020 at 1:05 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Black & Veatch Corp.	NEW LONDON AWC - Modified Penthouse Wood Wall	SK - 10
T. Eakkalak		May 28, 2020 at 1:05 PM
403093.2000.2200		NewLondonAWC - Modified Wood ...

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	None
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3

Wood Material Properties

	Label	Type	Database	Species	Grade	Cm	Emod	Nu	Therm..	Dens[k/ft^...
1	DF	Solid Sawn	Visually Graded	Douglas Fir-Larch	No.1		1	.3	.3	.035
2	SP	Solid Sawn	Visually Graded	Southern Pine	No.1		1	.3	.3	.035

Wood Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Column	2X4	Column	Rectangular	DF	Typical	5.25	.984	5.359	2.877
2	Modified Colu...	3-2X4B	Column	Rectangular	DF	Typical	15.75	26.578	16.078	39.809
3	Horizontal	4X4	Beam	Rectangular	DF	Typical	12.25	12.505	12.505	21.134

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
1	N1	-.5	5	0	0	
2	N2	-.5	-2	0	0	
3	N3	-.5	1	1.33	0	
4	N4	-.5	4	1.33	0	
5	N5	-.5	5	1.33	0	
6	N6	-.5	-2	1.33	0	
7	N7	-.5	5	2.66	0	
8	N8	-.5	-2	2.66	0	
9	N9	-.5	4	0	0	
10	N10	-.5	4	2.66	0	
11	N11	-.5	1	0	0	
12	N12	-.5	1	2.66	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction			
2	N2	Reaction	Reaction	Reaction			
3	N3						
4	N4						
5	N5	Reaction	Reaction	Reaction			
6	N6	Reaction	Reaction	Reaction			
7	N7	Reaction	Reaction	Reaction			
8	N8	Reaction	Reaction	Reaction			
9	N9						
10	N10						
11	N11						
12	N12						

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N2	N1			Column	Column	Rectangular	DF	Typical
2	M2	N6	N5			Modified Colu...	Column	Rectangular	DF	Typical
3	M3	N8	N7			Column	Column	Rectangular	DF	Typical
4	M4	N10	N4			Horizontal	Beam	Rectangular	DF	Typical
5	M5	N4	N9			Horizontal	Beam	Rectangular	DF	Typical
6	M6	N12	N3			Horizontal	Beam	Rectangular	DF	Typical
7	M7	N3	N11			Horizontal	Beam	Rectangular	DF	Typical

Wood Design Parameters

	Label	Shape	Length[ft]	le2[ft]	le1[ft]	le-bend top[ft]	le-bend bot[ft]	Kyy	Kzz	CV	Cr	y sway	z sway
1	M1	Column	7	3.5									
2	M2	Modified ...	7	3.5									
3	M3	Column	7	3.5									
4	M4	Horizontal	1.33										
5	M5	Horizontal	1.33										
6	M6	Horizontal	1.33										
7	M7	Horizontal	1.33										

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes	** NA **			None
2	M2						Yes	** NA **			None
3	M3						Yes	** NA **			None
4	M4						Yes				None
5	M5						Yes				None
6	M6						Yes				None
7	M7						Yes				None

Joint Loads and Enforced Displacements (BLC 1 : DL)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N3	L	X	-39
2	N3	L	Y	-51
3	N4	L	Y	-85
4	N4	L	X	39

Joint Loads and Enforced Displacements (BLC 3 : Wind - 0 Deg (+X))

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N3	L	X	-1012
2	N3	L	Y	365
3	N4	L	X	1677
4	N4	L	Y	-365

Joint Loads and Enforced Displacements (BLC 4 : Wind - 90 Deg (+Z))

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N3	L	Z	-1012
2	N3	L	My	408
3	N4	L	Z	1677
4	N4	L	My	-994

Joint Loads and Enforced Displacements (BLC 5 : Wind - 180 Deg (-X))

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N3	L	X	1012
2	N3	L	Y	365
3	N4	L	X	-1677
4	N4	L	Y	-365

Joint Loads and Enforced Displacements (BLC 6 : Wind - 270 Deg (-Z))

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N3	L	Z	1012
2	N3	L	My	-408
3	N4	L	Z	-1677
4	N4	L	My	994

Member Distributed Loads (BLC 3 : Wind - 0 Deg (+X))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	37.89	37.89	0	0
2	M2	X	37.89	37.89	0	0
3	M3	X	37.89	37.89	0	0

Member Distributed Loads (BLC 4 : Wind - 90 Deg (+Z))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	48.54	48.54	0	0
2	M2	X	48.54	48.54	0	0
3	M3	X	48.54	48.54	0	0

Member Distributed Loads (BLC 5 : Wind - 180 Deg (-X))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-53.86	-53.86	0	0
2	M2	X	-53.86	-53.86	0	0
3	M3	X	-53.86	-53.86	0	0

Member Distributed Loads (BLC 6 : Wind - 270 Deg (-Z))

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	48.54	48.54	0	0
2	M2	X	48.54	48.54	0	0
3	M3	X	48.54	48.54	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	DL	DL		-1		4				
2	Roof LL	LL								
3	Wind - 0 Deg (+X)	WL+X				4		3		
4	Wind - 90 Deg (+Z)	WL+Z				4		3		
5	Wind - 180 Deg (-X)	WL-X				4		3		
6	Wind - 270 Deg (-Z)	WL-Z				4		3		

Load Combinations

	Description	Solve	PD...	S...	BLC	Factor	BLC	Fact...	BLC	Factor	B...	Factor	B...	Factor	...	F.....	F.....	F.....	F.....	F...
1	1.0DL	Yes	Y		DL	1														
2	1.0DL + 0.6WL (0 DEG)	Yes	Y		DL	1	WL+X	.6	WL+Z											
3	1.0DL + 0.6WL (90 DEG)	Yes	Y		DL	1	WL-X		WL+Z	.6										

Load Combinations (Continued)

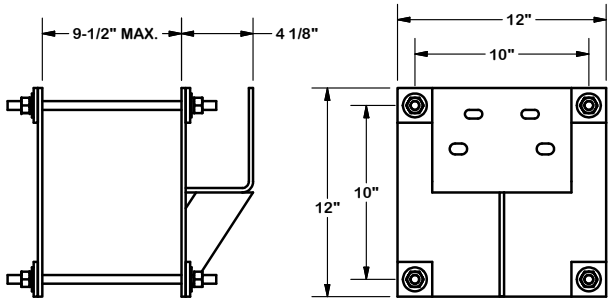
	Description	Solve	PD...	S...	BLC	Factor	BLC	Fact...	BLC	Factor	B...	Factor	B...	Factor	...	F.....	F.....	F.....	F.....	F...
4	1.0DL + 0.6WL (180 DEG)	Yes	Y		DL	1	WL-X	.6	WL-Z											
5	1.0DL + 0.6WL (270 DEG)	Yes	Y		DL	1	WL+X		WL-Z	.6										
6	0.6DL + 0.6WL (0 DEG)	Yes	Y		DL	.6	WL+X	.6	WL+Z											
7	0.6DL + 0.6WL (90 DEG)	Yes	Y		DL	.6	WL-X		WL+Z	.6										
8	0.6DL + 0.6WL (180 DEG)	Yes	Y		DL	.6	WL-X	.6	WL-Z											
9	0.6DL + 0.6WL (270 DEG)	Yes	Y		DL	.6	WL+X		WL-Z	.6										

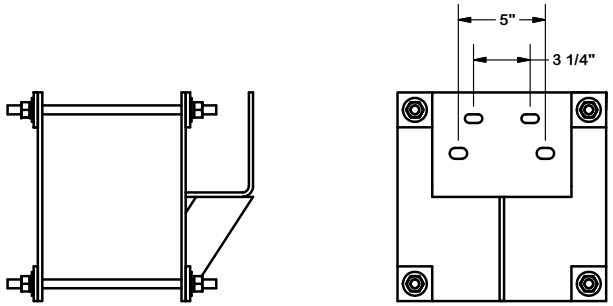
Envelope Wood Code Checks

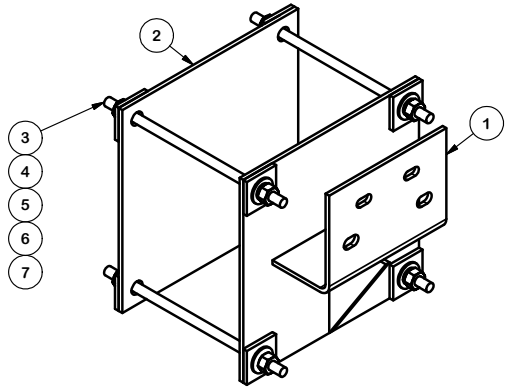
	Mem...	Shape	Code Ch...	Loc[ft]	LC	Shear C...	Loc...	Dir	LC	Fc' [k...	Ft' [ksi]	Fb1' [...	Fb2' [...	Fv' [ksi]	RB	CL	CP	Eqn
1	M1	2X4	.576	6.052	3	.337	3.0...	y	2	.59	1.013	1.474	1.65	.18	11.431	.983	.342	3.9-3
2	M2	3-2X4B	.634	3.063	9	.817	3.0...	z	9	.765	1.013	1.498	1.65	.18	3.81	.998	.443	3.9-3
3	M3	2X4	.576	6.052	5	.337	3.0...	y	2	.59	1.013	1.474	1.65	.18	11.431	.983	.342	3.9-3
4	M4	4X4	.365	1.33	7	.533	0	z	5	1.7	1.013	1.5	1.5	.18	2.135	1	.985	3.9-3
5	M5	4X4	.365	0	9	.533	0	z	3	1.7	1.013	1.5	1.5	.18	2.135	1	.985	3.9-3
6	M6	4X4	.245	1.33	5	.268	0	y	3	1.7	1.013	1.5	1.5	.18	2.135	1	.985	3.9-3
7	M7	4X4	.245	0	3	.268	1.33	y	5	1.7	1.013	1.5	1.5	.18	2.135	1	.985	3.9-3

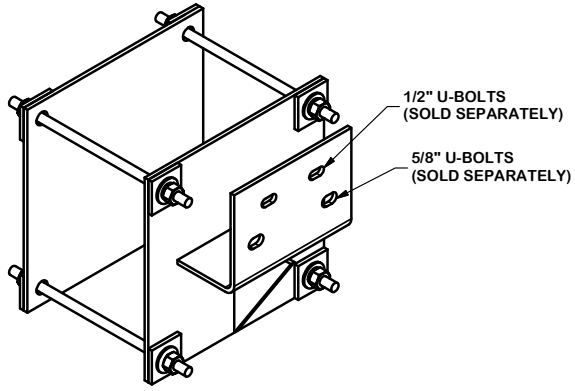
6. ATTACHMENTS

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-SP22	HEAVY WALL MOUNT BRACKET		16.16	32.32
2	2	SP-221BP	12" xX 12" WALL MOUNT BACKING PLATE	12 in	10.10	20.19
3	8	G12R-12	1/2" x 12" THREADED ROD (HDG.)		0.35	2.81
4	16	SQW12	1/4" x 2" FLAT STOCK	2 in	0.27	4.26
5	16	G12FW	1/2" HDG USS FLATWASHER		0.03	0.55
6	14	G12LW	1/2" HDG LOCKWASHER		0.01	0.19
7	16	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.15
					TOTAL WT. #	64.01









TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: HOLLOW WALL KIT

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 5/25/2011		SP221

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 6/2/2011	SP221

SITE PRO 1

Hot-Dip Galvanized Threaded Rods

A valmont COMPANY

Features: Available in cut lengths, or 6' sections.

Construction: SAE J429 (Latest Revision) Grade 2 Stud, Rolled or Cut UNC Threads. Coarse threads

Design Criteria: Conforms to the minimum requirements as stated in SAE J429 (Latest Revision) Grade 2 Stud, Rolled or Cut CNC threads. SAE J429 Grade 2 (Yield Fy = 57 ksi / Tensile Fu = 74 ksi). All finished goods are Hot Dip Galvanized in accordance with ASTM A123 requirements.

Part #	Diameter	Length	Weight
G38R-12	3/8"	12"	0.3 lb.
G38R-72	3/8"	72"	1.8 lb.
G12R-6	1/2"	6"	0.25 lb.
G12R-8	1/2"	8"	0.35 lb.
G12R-10	1/2"	10"	0.45 lb.
G12R-12	1/2"	12"	0.50 lb.
G12R-20	1/2"	20"	0.90 lb.
G12R-24	1/2"	24"	1.10 lb.
G12R-72	1/2"	72"	3.20 lb.
G58R-8	5/8"	8"	0.55 lb.
G58R-10	5/8"	10"	0.70 lb.
G58R-12	5/8"	12"	0.85 lb.
G58R-14	5/8"	14"	1.00 lb.
G58R-18	5/8"	18"	1.30 lb.
G58R-24	5/8"	24"	1.70 lb.
G58R-48	5/8"	48"	3.45 lb.
G58R-72	5/8"	72"	5.20 lb.
G34R-72	3/4"	72"	7.45 lb.

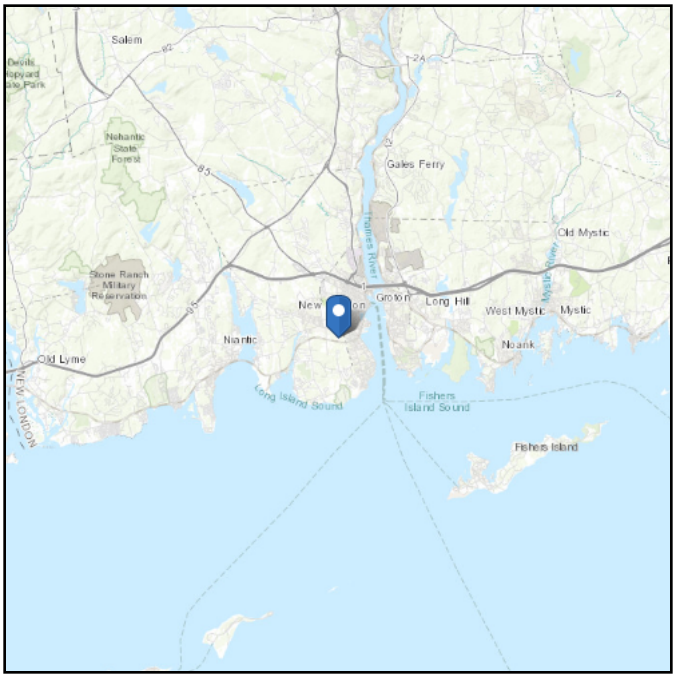
New York, NY 888-438-7761
Los Angeles, CA 888-776-1937
Salem, OR 888-880-9191
Atlanta, GA 866-901-0603
Plymouth, IN 888-753-7446
Dallas, TX 888-809-5151

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: III
Soil Class: D - Stiff Soil

Elevation: 44.1 ft (NAVD 88)
Latitude: 41.336056
Longitude: -72.115667



Wind

Results:

Wind Speed:	145 Vmph
10-year MRI	80 Vmph
25-year MRI	89 Vmph
50-year MRI	99 Vmph
100-year MRI	109 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1B and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

Date Accessed: Tue Apr 28 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings in health-care facilities shall be protected against wind-borne debris as specified in Section 26.10.3.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

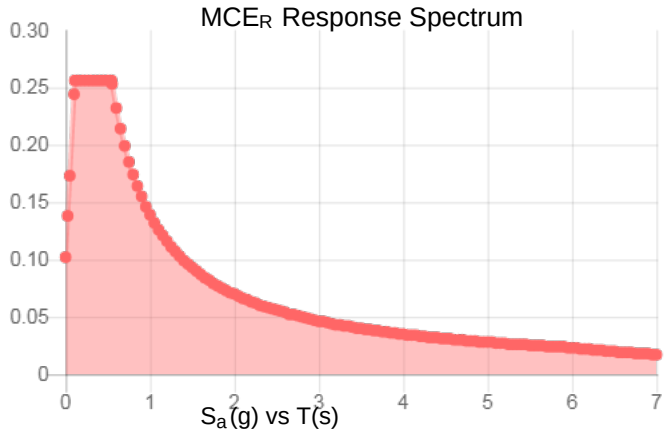
Seismic

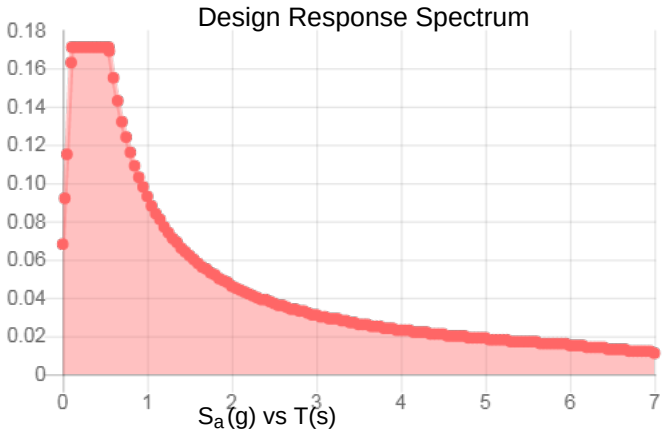
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.16	S_{DS} :	0.171
S_1 :	0.058	S_{D1} :	0.093
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.08
S_{MS} :	0.256	PGA_M :	0.127
S_{M1} :	0.139	F_{PGA} :	1.6
		I_e :	1.25

Seismic Design Category B





Data Accessed: Tue Apr 28 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Apr 28 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.